NATIONAL CLINICAL EFFECTIVENESS COMMITTEE

Tús Áite do Shábháilteacht Othar
Patient Safety First

Communication (Clinical Handover) in Maternity Services

National Clinical Guideline No. 5

An Roinn Sláinte
DEPARTMENT OF HEALTH

November 2014

Guideline Development Group
The National Communication (Clinical Handover) Sub-group/Guideline Development Group (GDG) was a work stream of the National Implementation Group – HSE/HIQA Maternity Services Investigations (HSE) under the governance of the Acute Hospitals Division, HSE. This group will be referred to as the GDG throughout this document. The GDG was supported by the Clinical Strategy and Programmes Division HSE; the Office of the Nursing and Midwifery Services Director, HSE; the Quality and Patient Safety Division, HSE; Patient Representative Groups; the National Ambulance Service; the Clinical Indemnity Scheme, (State Claims Agency); the Irish Association of Directors of Nursing and Midwifery (IADNAM); Health and Social Care Professionals Committee and the College of Anaesthetists, Royal College Physicians of Ireland; Royal College of Surgeons in Ireland and the Nursing and Midwifery Board of Ireland (NMBI), University College Dublin (UCD).

Using this National Clinical Guideline
This guideline is intended to be relevant to all healthcare staff involved in the communication (clinical handover) of patient care in maternity services. It outlines the general and specific measures for clear and focused communication of information relating to the patient's condition, both urgent and routine, for in-patients and patients attending maternity hospital services in Ireland. This includes both stand-alone maternity hospitals and co-located maternity units in Ireland.

A summary version of the National Clinical Guideline, is available on the website:
www.health.gov.ie/patient-safety/ncec

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Disclaimer
The Communication (Clinical Handover) Sub-group/Guideline Development Group expect that healthcare professionals will use clinical judgement, medical, midwifery and nursing knowledge in applying the general principles and recommendations contained in this document. The National Clinical Guideline recommendations do not replace or remove clinical judgement or the professional care and duty necessary for each specific patient case. Recommendations may not be appropriate in all circumstances and decisions to adopt specific recommendations should be made by the practitioner taking into account the circumstances presented by individual patients and available resources.

National Clinical Effectiveness Committee (NCEC)

The National Clinical Effectiveness Committee (NCEC) is a Ministerial committee established as part of the Patient Safety First Initiative. The NCEC role is to prioritise and quality assure to the level of international methodological standards National Clinical Guidelines and National Clinical Audit so as to recommend them to the Minister for Health to become part of a suite of National Clinical Guidelines and National Clinical Audit.

National Clinical Guidelines which have been quality assured and recommended by NCEC for implementation provide robust evidence-based approaches to underpin or define models of care as appropriate. They provide guidance and standards for improving the quality, safety and cost-effectiveness of healthcare in Ireland. The implementation of clinical guidelines can improve health outcomes, reduce variation in practice and improve the quality of clinical decisions.

NCEC Terms of Reference

- Apply criteria for the prioritisation of clinical guidelines and audit for the Irish health system.
- Apply criteria for quality assurance of clinical guidelines and audit for the Irish health system.
- Disseminate a template on how a clinical guideline and audit should be structured, how audit will be linked to the clinical guideline and how and with what methodology it should be pursued.
- Recommend clinical guidelines and national audit, which have been quality assured against these criteria, for Ministerial endorsement within the Irish health system.
- Facilitate with other agencies the dissemination of endorsed clinical guidelines and audit outcomes to front-line staff and to the public in an appropriate format.
- Report periodically on the implementation of endorsed clinical guidelines.

In response to the HIQA *Patient Safety Investigation Report into Services at University Hospital Galway* (2013), the NCEC was requested by the Minister for Health to commission and quality assure a number of National Clinical Guidelines. The national clinical handover guideline is one of these guidelines.

The NCEC in collaboration with the Acute Hospitals Division, HSE, Quality and Patient Safety and Clinical Strategy and Programmes divisions considered that the breadth and scope of this complex multi-disciplinary guideline requires a multi-phase approach.

Phase 1 provides for clinical handover within in-patient maternity hospital services. This guideline published November 2014 was developed by a Guideline Development Group under the chairmanship of Ms Eilish Croke. Phase 2 has commenced and focuses on clinical handover within acute hospital services including paediatric hospitals.

The National Clinical Guideline – Communication (Clinical Handover) in Maternity Services was quality assured by the NCEC and endorsed by the Minister for Health for implementation in the Irish health system.

Information on the NCEC and endorsed National Clinical Guidelines is available at:
www.health.gov.ie/patient-safety/ncec.

Acknowledgements
The GDG wish to acknowledge the contribution of a number of people and groups to this project, (no particular order was used).

- Dr. Michael Shannon, Director of Nursing and Midwifery Services and Assistant National Director, Clinical Strategy & Programmes Division, HSE, & Adjunct Associate Professor UCD School of Nursing and Midwifery and Health Systems, Fellow Faculty of Nursing & Midwifery FFNMRCSI (Ad Eundem).
- Dr. Martin McNamara, Dean of Nursing and Head of School of Nursing, Midwifery & Health Systems, UCD Health Sciences Centre.
- Dr. Áine Carroll, National Director, Clinical Strategy and Programmes Division, HSE.
- National Implementation Group – HSE/HIQA Maternity Services Investigations, chaired by Ms. Angela Fitzgerald.
- Dr. Tony O'Connell, National Director, Acute Services, HSE.
- The National Clinical Effectiveness Committee, Department of Health.
- Ms Michelle O'Neill, Senior Health Economist, Health Information and Quality Authority (HIQA).

International reviewers:
Ms. Eleanor R. Robinson, LAT ST3 Plastic Surgery, Derriford Hospital, NHS Trust, Plymouth, Devon, UK and Honorary researcher Nuffield Department of Surgical Sciences, University of Oxford. Author of a recent systematic review on intra-hospital handover.

Dr. Kwang Chien Yee, Senior Lecturer in Medicine, University of Tasmania, Australia. Author of the OSSIE Guide to Clinical Handover Improvement Australian Commission on Safety and Quality in Health Care.

Ms. Ming Chao Wong, University of Tasmania, co-author of the Ossie Guide to Clinical Handover Improvement, Australia Commission on Safety and Quality in Health Care.

- All who provided feedback nationally.
- Research participants in the clinical area.
- Patient/service users who participated in the focus groups.
- Managers in the health service who participated in the research and facilitated site access.

I am grateful to the following who provided representation on the GDG:
Royal College of Physicians of Ireland; Clinical Strategy and Programmes Division, HSE; Patient Advocacy Unit, HSE; Nursing and Midwifery Board of Ireland; HSE Communications; University College Dublin; Irish Association of Directors of Nursing and Midwifery; Quality and Patient Safety Division, HSE; National Ambulance Service; States Claims Agency; Open Disclosure Group; Project Manager National Advocacy Unit, Quality and Patient Safety Division, HSE.

Eilish Croke

Eilish Croke
Chair, Communication (Clinical Handover) Sub-group/Guideline Development Group (GDG)

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Glossary of terms

Definitions within the context of this document

Clinical Handover (sometimes called clinical handoff) refers to 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.

Coroner's Report (April 2013): The Report by Coroner, Dr. Ciaran McLoughlin, following the inquest into the death of Savita Halappanavar.

Director of Nursing and/or Midwifery: Some maternity hospitals/units have a dedicated Director of Midwifery while others have a Director of Nursing and Midwifery.

Electronic patient record: An electronic patient record is a digital record of information about a patient, which provides patient information in real-time and securely to authorised users. It is analogous to the traditional patient's paper chart.

Emergency: An unexpected, serious event, which may be harmful for patients and requires an immediate response.

Flexible standardisation: The idea that effective clinical handover involves local interpretation of a standard in order to accommodate contextual factors (Australian Healthcare and Hospitals Association, 2009; Australian Commission on Safety and Quality in Health Care, 2013). This principle is particularly relevant to inter-departmental clinical handovers. The literature suggests that clinical handovers occurring between units should be approached somewhat differently to intra-departmental clinical handovers, including shift change clinical handover, since they require a greater degree of negotiation and collaboration between specialities and professions, whose priorities and information requirements can differ greatly (Beach *et al.* 2012; Hilligoss and Cohen, 2013).

HIQA Report (October 2013): *The Patient Safety Investigation Report on Services at University Hospital Galway (UHG)*.

HSE Report (June 2013): The Report on the HSE investigation into events which took place in UHG, relating to the death of Savita Halappanavar.

Inter-departmental: This relates to patient transfer between departments within a hospital or between two hospitals e.g. ward to ICU within the same hospital or a different hospital.

Models of hospitals: These describe four types of acute hospitals in Ireland, as proposed by the National Acute Medicine Programme, Clinical Strategy and Programmes Division, HSE; The models are: model 4 - tertiary hospital; model 3 - general hospital; model 2 - local with selected (GP-referred) patients; and model 1 - community/district hospitals.

Multi-disciplinary: Members of different disciplines (in this instances required to attend handover meetings) to be agreed by the organisation.

National Implementation Group – HSE/HIQA Maternity Services Investigations: This was established to advise on and oversee the implementation of the HSE Report on NIMT 50278 and the subsequent recommendations of the HIQA Report (October 2013).

The Communication (Clinical Handover) Sub-group/Guideline Development Group: This is a sub-group of the *National Implementation Group – HSE/HIQA Maternity Services Investigations*. It is referred to as the Guideline Development Group (GDG) for the remainder of the document.

(List of abbreviations in Appendix 14)

1 Background

1.1 Need for National Clinical Guideline

1.1.1 Burden of topic

'The only conceivably worthy honour due to those harmed is to make changes that will save other people and other places from similar harm', (Berwick 2013).

'Handover of care is one of the most perilous procedures in medicine, and when carried out improperly can be a major contributory factor to subsequent error and harm to patients. This has always been so, but its importance is escalating with the requirement for shorter hours for doctors and an increase in shift patterns of working', Professor Sir John Lilleyman, Medical Director, National Patient Safety Agency (NHS 2004).

The HSE undertook to provide a report on the events which took place between the 21st of October and the 28th of October, 2012 in Galway University Hospital (GUH), relating to the maternal death of Savita Halappanavar, and to establish if any aspect of her care may have contributed to her death. The HSE also set out to make any necessary local and national recommendations to address identified contributory factors or causes so as to prevent future harm arising from these causes and to improve the safety of services for future service users. The HIQA and Coroner Reports on the same case, also provide recommendations relating to communication.

The HSE established a National Implementation Group – HSE/HIQA Maternity Services Investigations in March 2013 to co-ordinate and oversee the implementation of any recommendations made by the investigation teams.

The Communication Sub-group/Guideline Development Group was set up by the National Implementation Group to develop a National Clinical Guideline with recommendations on Communication (Clinical Handover). See Terms of Reference for more detail (Appendix 1).

1.1.2 Risks associated with clinical handover

Risks associated with clinical handover whether as part of shift or interdepartmental clinical handover or communication of information in relation to the deterioration in a patient's condition are similar and include:

- Delay in critical referrals leading to adverse incidents.
- Delay in treatments leading to increased risk of infection and/or exacerbation of infection or illness, which may lead to poor patient outcomes, death or prolonged hospital stays.
- Competence of staff.
- Lack of continuity of care.
- Waste of valuable time when inaccurate and/or incomplete information is provided.
- Inappropriate treatment being provided for patients.

Risks associated with poor clinical handover practices may be further compounded by:

- Hierarchical structures in the health service.
- Resistance to change.
- Lack of standardisation of clinical handover practices.
- Lack of effective implementation of the National Clinical Guideline on clinical handover.

1.2 Clinical and financial impact of topic

Poor communication at clinical handover and in other situations has been identified as a contributing factor in adverse incidents where patient care is put at risk. In the UK, the National Confidential Enquiry into Patient Outcomes and Death (NCEPOD) (2005, 2012) highlighted communication failures between teams as a contributing factor to delays in referrals and in delivering appropriate essential care.

Holly and Poletick (2013) undertook a systematic review of literature on the transfer of information during nurse transitions in care. The findings demonstrate that information transferred may be random and variable, inconsistent and incongruent, inaccurate or absent and they suggest that a consistent guideline or framework may provide a formula for an optimal shift report.

The Joint Commission (USA) (2007) identified that timely, accurate, complete and unambiguous information that is understood by the recipient, reduces errors and results in improved patient safety. While no studies were identified that analysed the economic impact of clinical handover in maternity services, two studies were identified, which point to evidence that introducing a change to clinical handover practices can be cost effective in acute care settings (Hess *et al.* 2010, Yao *et al*. 2012). Hess *et al.* (2010) analysed the economic impact of a clinical handover improvement initiative for patients being discharged from a respiratory acute care unit to a rehabilitation facility. The initiative involved supplementing written handoffs with verbal telephone reports. Using a historical control group of patients readmitted to the unit in the previous two years as the comparator, Hess *et al.* (2010) examined the economic impact of the initiative on readmission within 72 hours of discharge as the primary end point, with total cost, including readmission cost, being the secondary end point. The authors concluded that supplementing a written report with a verbal telephone report was associated with 'a significant reduction in cost', with the estimated median total cost of care significantly less following the introduction of the intervention.

Yao *et al*. (2012) used a staff education programme aimed at improving clinical handoff at the point of discharge as a case study to describe a method for prospective evaluation of the cost of a 'generic' health intervention. The endpoint in the economic analysis was 'expected monetary benefit', a measure of expected health gain in Quality Adjusted Life Years (QALY), and the comparator was the cost of treating adverse events in the absence of the intervention. Based on estimates for delivering the educational intervention in The Netherlands, Yao *et al*. (2012) calculated the net cost and reported that the intervention was 'highly cost-effective' at only about €214 per Quality Adjusted Life Year (QALY) gain. The two studies are summarised in Appendix 2.

It is envisaged that implementing this National Clinical Guideline will incur minimal cost to the system as a majority of units were identified, in the research conducted for this project, as being aware of the recommended tool for escalating care in relation to a deteriorating patient (ISBAR), and existing education via the COMPASS©/NEWS will continue to provide education in relation to the ISBAR communication tool. The COMPASS©/NEWS education programme is recommended for all staff in maternity units as non-pregnant patients must have the NEWS performed routinely. The IMEWS education programme also includes ISBAR. In addition the Irish Maternity Early Warning System (IMEWS) National Clinical Guideline No.4 contains the ISBAR communication tool.

$ISBAR_3$ will require additional explanation as it is not contained in the COMPASS©/NEWS education programme. The GDG recommends developing a web-based education programme and a mobile App of the ISBAR and $ISBAR_3$ mnemonic for use with hand-held devices in clinical areas to provide an explanation on their use in clinical handover. This will be developed in conjunction with existing IT expertise within the health system, and will be accessible by all healthcare workers free of charge. While it is anticipated that the App may incur an initial development cost, it is recommended that the App should be maintained and updated by the HSE IT service as part

of its remit to provide and maintain IT support for HSE staff. Accordingly, ongoing maintenance should not represent an additional cost. The proposed app will provide education on using the recommended shift clinical handover tool/ inter-departmental clinical handover tool ($ISBAR_3$). The App will also allow ease of access to this National Clinical Guideline. A business case for this App will be required.

The GDG recommends that clinical handover practice should be audited and monitored by the relevant quality and safety committee of the healthcare organisation (Recommendation 6). It is acknowledged that this could have a budget impact for some maternity units, in terms of staff hours required to conduct audit; however such costs could be minimised by conducting audit of clinical handover in conjunction with standard audit activities already in place. The GDG also recommends that the healthcare organisation should ensure that there is mandatory protected time for shift clinical handover (Recommendation 15). It is acknowledged that this could have opportunity costs and therefore a budget impact for some maternity units, should it lead to the need for additional staff hours; however such costs could be minimised or eliminated with judicious rostering.

1.3 Aim of National Clinical Guideline

The aim of this National Clinical Guideline is to describe the elements that are essential for timely, accurate, complete, unambiguous and focused communication of information in maternity services in Ireland, relating to the patient's condition, both urgent and routine, to include the following:

- Professional consultations such as:
  - Team to team.
  - One profession to another.
  - Laboratory to team.
  - Radiology to team.

- Deterioration in a patient's condition.

- Transitions of care such as:
  - Clinical handover of patient care at a change of shift.
  - Clinical handover to and from a higher level of care (e.g. ambulance staff to ED/AMAU staff, Model 2/3 hospital to Model 4 hospital, ward to ICU/CCU, ICU/CCU to ward).
  - Communication with patients and/or their relatives, to ensure that a treatment plan is readily explained and understood.

Note:

- Dealing with emergency/crisis situations will always take precedence and shift clinical handover should be provided for staff involved in the emergency/crisis situation when the emergency/crisis situation has been dealt with.

1.3.1 Expected outcomes

All communication (clinical handover) between healthcare staff in maternity services will be conducted using a structured communication tool, promoting standardisation of practice and minimisation of variability, thus reducing risk for patients.

1.4 Scope of the National Clinical Guideline, target population and target audience

The British Medical Association (BMA), (2004) defined clinical handover as '*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*'.

The National Clinical Guideline for in-patients and patients attending maternity hospital services in Ireland is relevant and has been developed for all healthcare staff, doctors, midwives, nurses, health and social care professionals, healthcare assistants and other staff involved in the clinical care of patients in maternity services; and managers responsible for the development, implementation, review and audit of communication/clinical handover practice in individual hospitals or group of hospitals. The National Clinical Guideline also applies to education and training support staff involved in the organisation and delivery of the relevant education programme.

The public and patients will also find this guideline of interest as it outlines the general and specific measures for clear and focused communication of information relating to the patient's condition, both urgent and routine and how these can and should be incorporated into quality measures to safeguard the quality of patient care.

1.4.1 What the guideline covers

This guideline makes recommendations on the process of communication (clinical handover) and the content of communication (clinical handover) of patient care between healthcare staff; and between healthcare staff and patients/relatives for in-patients and patients attending maternity hospital services in Ireland.

1.4.2 What the guideline does not cover

This guideline does not cover:

- Routine recording of patient care in the patient's medical chart used in maternity units.
- The response following communication of information e.g. where a patient is deteriorating or critically ill.
- Clinical handover in any other setting. The development of a clinical handover guideline for acute hospitals has commenced.

1.4.3 The service users to whom the guideline applies

All service users who access maternity hospital services in Ireland.

1.4.4 The health service areas where the guideline applies

All maternity in-patients and patients attending maternity hospital services in Ireland.

1.5 Guideline Development Group

A Guideline Development Group (GDG) comprising key stakeholders and representation from professional and other groups was established. Additional representation was sought following recommendations made at the inaugural meeting of the GDG.

- The GDG met on 10 occasions between October 2013 and October 2014 (Appendix 3).
- List of membership of GDG is in Appendix 1.
- No conflicts of interests were declared by the members of the GDG.
- The role of the GDG members was to develop the guideline, formulate the recommendations and provide feedback from the groups they represented.
- The Office of the Nursing and Midwifery Services Director (ONMSD) provided funding for the literature review and research which was conducted by University College Dublin. The ONMSD had no influence on the final recommendations.

1.6 Methodology and literature review

Terms of Reference were agreed (Appendix 1) and the guideline was developed *de novo*, through a process of reviewing and critically appraising existing evidence, combined with input from a multidisciplinary group of experts and intended users, as well as wide stakeholder consultation. A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was undertaken, with barriers and enablers identified (Appendix 4).

The guideline was developed from a systematic review of literature (Appendix 2), complemented with evidence from expert input and extensive stakeholder consultation. While being developed, the guideline was continuously assessed using the AGREE II tool (Appendix 5) as recommended by the NCEC. The GDG engaged a project methodologist, research assistant and research midwife to conduct the systematic review and to support the development and design of the stakeholder consultation methods.

All available evidence was reviewed following the literature search and review as outlined in Appendix 2 and the recommendations were graded according to the Scottish Intercollegiate Guidelines Network (SIGN) methodology checklists for quality of evidence (Scottish Intercollegiate Guidelines Network (SIGN) 2011), as outlined in Section 1.7 below.

The stakeholder consultation involved: a national survey of the nineteen stand-alone maternity hospitals and co-located maternity units in Ireland; non-participant observation of clinical handover events; and focus group discussions and interviews with a purposive sample of health professionals and other key informants, including representatives of service users (see report Appendix 6). The national survey involved a self-report questionnaire to elicit information on methods and systems of communication and clinical handover practices in maternity services nationally. The questionnaire was administered to the chief executive officer of each hospital or unit. The GDG members provided oversight for the stakeholder consultation process, advising the project methodologist as appropriate.

The GDG discussed each recommendation in detail and each recommendation was included by unanimous or consensus agreement. The GDG consulted with a large number of stakeholders including the National Implementation Group – HSE/HIQA Maternity Services Investigations and the National Clinical Effectiveness Committee (NCEC). Following receipt of feedback the document was revised with agreement of the GDG.

1.7 Grading of recommendations

All decisions regarding the quality of evidence and the strength of recommendations were based on summaries of evidence from the literature review and the evidence was weighted according to the SIGN (2011) grading criteria. Accordingly, high quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias were rated as the highest quality evidence (rated as ++) using the SIGN checklist. Published RCTs with a low risk of bias were graded 1+, those that contained an element of bias were graded 1-, and so forth. Just one systematic review was rated as high quality (2++). Case reports, case series, post-implementation and audit/review were graded as 3 and expert opinion as 4, the lowest grading of evidence. The evidence from stakeholder consultation was also graded as 4. Where existing guidance is the only source used to guide a recommendation, this is specified. The basis for level of evidence and grade of recommendation are presented in tables 1.8.1 and 1.8.2. A rationale for the recommendations is outlined and practical guidance to support the delivery of the recommendations is provided.

Table 1.8.1 SIGN (2011) Grading criteria

Grade	Grade descriptor
1++	High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias (RCTs rated as high quality (++) using the SIGN checklist for RCTs)
1+	Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias (RCTs rated as acceptable (+) using the SIGN checklist for RCTs)
1-	Meta-analyses, systematic reviews, or RCTs with a high risk of bias (RCTs rated as unacceptable (-) using the SIGN checklist for RCTs)
2++	High quality systematic reviews of case control, cohort studies, RCTs or before-and-after intervention studies (Rated as high quality (++) using the SIGN checklist for reviews)
2++	High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
2+	Systematic reviews of case control, cohort studies, RCTs or before-and-after intervention studies with a possible risk of bias (Rated as acceptable (+) using the SIGN checklist for reviews)
2+	Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2-	Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal. Before-and-after intervention studies with a risk that the relationship is not causal.
3	Non-analytic studies, e.g. case reports, case series, post-implementation audit/review
4	Expert opinion

Recommendations arising out of published guidelines were also assigned scores according to the National Quality Assurance Criteria Score, published by the Health Information and Quality Authority (HIQA 2011) (Appendix 7). These scores represent a general indication of the comprehensiveness of published guidelines and are summarised in Table 1.8.2. Using A, B, C and D grading scores, the strength of the evidence supporting each recommendation, was agreed by consensus among the GDG.

Table 1.8.2 ABCD Criteria/Consensus Grade

Grade	Grade descriptor
A	At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population or; a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results
B	A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+
C	A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2++
D	Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+

1.8 International and national review

1.8.1 International review

The draft document was sent to three international reviewers with a covering letter actively seeking feedback and comment, in September 2014, with a two week period allowed for feedback. The international reviewers are as follows:

- Ms. Eleanor R Robinson, LAT ST3 Plastic Surgery, Derriford Hospital, NHS Trust, Plymouth, Devon, UK and Honorary researcher Nuffield Department of Surgical Sciences, University of Oxford, UK. Author of a recent systematic review on intra-hospital handover.

- Dr Kwang Chien Yee, Senior Lecturer in Medicine, University of Tasmania, Australia. Author of the OSSIE Guide to Clinical Handover Improvement Australian Commission on Safety and Quality in Health Care.

- Ms Ming Chao Wong, University of Tasmania, co-author of the Ossie Guide to Clinical Handover Improvement, Australia Commission on Safety and Quality in Health Care.

International reviewers' feedback

The guideline was commended for its quality and comprehensiveness by the three international reviewers and some advice was provided from their experience and previous research. The following includes amendments made to the guideline as a result of feedback from the international reviewers:

- The content of communication (clinical handover) was included in section 1.4.1.
- Recommendation 9 was amended to include the word *accurate*.
- Recommendation 10 was amended to include *where possible*.
- The importance of adopting electronic patient records (this was identified by a significant number of reviewers both international and national).
- The incorporation of procedures and guidelines in addition to protocols.
- Clinical handover education and training must be part of staff orientation and ongoing in-service education.
- Healthcare organisations should ensure that there is mandatory protected time for shift clinical handover.
- Additional supporting material was recommended.
- The cultural and educational differences between professions (midwives and obstetricians).
- Advice provided:
  - There are a wide range of mnemonics in healthcare, it maybe doesn't matter which one used, rather that one is chosen and used regularly between hospitals.
  - Work does not stop out of hours due to the unpredictability of the work, this makes the chance of limiting the provision of care to the normal working day impossible and relies upon clear processes of work and communication existing at all times of the day no matter what the level of seniority of the leader in charge.
  - There can be difficulty in knowing who is leading the team or who is responsible for requesting and reviewing investigations.
  - Most frequent handover team combinations are midwives and obstetricians who have a broad base of common language, however, there is a reliance on the whole hospital in the obstetric service so there does need to be a focus on reducing the use of mnemonics or acronyms for maternity services to reduce confusion and ambiguity.
  - The distance between handover and patient care is the real problem – tracing an error from handover to the frontline patient care is very difficult and costly to prove.
  - Handover is not just the potential point of error but one which could be optimised to enhance patient safety, actually providing an informal multi-disciplinary team point within the patient's journey.

1.8.2 National review

A number of key national stakeholders were contacted by email and invited to provide feedback, comments/suggestions on the draft guideline. All those who were asked generously agreed to review this guideline with no payment or gratuity. The draft document was forwarded to each member of the national review group in September 2014, with a two week period to provide feedback, comments/suggestions, using an online survey. The national review group included:

- Prof. Michael Turner, Clinical Lead, National Clinical Programme for Obstetrics and Gynaecology.
- Dr. Áine Carroll, National Director, Clinical Strategy and Programmes Division, HSE.
- Dr. Michael Shannon, Nursing and Midwifery Services Director, ONMSD, HSE.
- Dr. Tony O'Connell, National Director, Acute Services Division, HSE.
- Dr. Philip Crowley, Quality and Patient Safety Division, HSE.
- Dr. Mary Browne, Quality and Patient Safety Division, HSE.
- Ms. Angela Fitzgerald, Chair, National Implementation Group – HSE/HIQA Maternity Services Investigations (HSE).
- The National Implementation Group – HSE/HIQA Maternity Services Investigations HSE.
- Dr. Tony Holohan, Chief Medical Officer, Department of Health.
- Dr. Siobhan O'Halloran, Chief Nursing Officer, Department of Health.
- The Health Information and Quality Authority (HIQA).
- The Institute of Obstetricians and Gynaecologists, RCPI.

All members of the Communication (Clinical Handover) Sub-group/GDG – for distribution to relevant personnel in the group/organisation they represent, including:

- Consultant Obstetrician/Gynaecology.
- Health and Social Care Professionals.
- Patient Advocacy Unit, HSE.
- Acute and Palliative Care Services.
- Nursing and Midwifery Board of Ireland – NMBI.
- National Acute Medicine Programme.
- HSE Communications.
- Project Methodologist.
- Paediatric Consultants.
- Quality and Patient Safety Division, HSE.
- National Ambulance Service.
- State Claims Agency.
- Laboratories.
- Junior Obstetrics and Gynaecology Society of Ireland (JOGS).
- National Clinical Programme for Emergency Medicine.
- National Clinical Programme for Neonatology.
- Irish Association of Directors of Nursing and Midwifery (IADNAM).
- National Clinical Programme for Critical Care.
- Patient representative group.
- Faculty of Radiology.
- College of Anaesthetists.
- Intensive Care Society of Ireland.
- Irish Association of Critical Care Nurses.
- Irish Association for Emergency Medicine.
- Irish Society of Clinical Microbiologists.
- National Lead for Midwifery, HSE.
- Royal College of Physicians of Ireland (RCPI).
- Royal College of Surgeons in Ireland (RCSI).
- RCSI Faculty of Radiologists.

National reviewers' feedback

The guideline was commended for its quality and comprehensiveness by a number of national reviewers. The following includes amendments made to the guideline following feedback from national reviewers:

- Highlighting that clinical handover has to be identified as a risk.
- Clinical handover should take priority over all other work except emergencies.
- The importance of adopting electronic patient records (this was identified by a significant number of reviewers both national and international).
- Local policies, procedures and guidelines must be developed in compliance with the National Clinical Guideline.
- Sample tools may be adapted for local use.
- Inclusion of the Care Pathway for the Deteriorated Critically Ill Pregnant Woman schema following Recommendation 28 in relation to communication of patient deterioration.
- Healthcare organisations should implement multidisciplinary shift clinical handover (if possible).
- Reiteration within the body of the guideline that it relates specifically to maternity services.
- Clinical responsibility can only be transferred when responsibility is accepted by the team to which the patient is being referred.
- Following clinical handover clinicians should perform their own assessment of patients to confirm any diagnoses made.
- Inclusion of additional information on the Safety Pause.
- Clear identification of the reason why the guideline was developed at the beginning of the document.
- Recommendations 24 and 25, relating to Radiology and Laboratory, were amended following feedback, with additional information on the PeerVue and MedLIS systems provided in the appendices.
- Recommendation 26 was amended to highlight that the patient and/or carer(s) are provided with up to date factual information in relation to the patient's condition, care and treatment.
- The inclusion of the ISBAR and $ISBAR_3$ communication tools in the body of the text for the convenience of readers.

Some feedback identified important issues for the delivery of safe quality care in maternity services, which could not be addressed within this guideline, as they were outside the scope of this project.

1.9 Procedure for update of National Clinical Guideline

This National Clinical Guideline is due for review in November 2017. At that time a systematic search of the literature for new evidence will be conducted. External colleagues and international experts in this area will be circulated with the current National Clinical Guideline and their views sought for updates. This process will be overseen by a group under the governance of the Acute Hospitals Division, HSE. Following this it will be submitted to the National Clinical Effectiveness Committee for review and endorsement.

1.10 Implementation of National Clinical Guideline

The HSE and all healthcare organisations are responsible for dissemination and implementation of the guideline including the provision of education in using the recommended communication tools.

1.11 Roles and responsibilities

Each healthcare professional has a role to play in minimising the risk of communication failures through adherence to best practice as recommended in this National Clinical Guideline, e.g. providing clear and focused communication of information relating to the patient's condition, both urgent and routine.

1.11.1 Organisational responsibilities

Within each organisation the CEO/General Manager/Hospital Manager has overall corporate responsibility for the implementation of the guideline, to ensure that there is a system in place for the safe and effective communication (clinical handover) of patient care.

1.11.2 HSE senior managers

- Assign personnel with responsibility, accountability and autonomy to implement the guideline and education programme.
- Provide managers with support to implement the guideline.
- Ensure local policies/guidance are in place in each acute hospital to support implementation.
- Monitor the implementation of the guideline to support ongoing evaluation and remedial action.
- Link the implementation group/committee with corporate responsibility.

1.11.3 Hospital senior managers

- Provide a local governance structure to support the implementation and ongoing evaluation of the guideline.
- Ensure clinical and educational staff are supported to implement the guideline.
- Ensure development of local policies, guidance to support implementation and associated audit and evaluation.

1.11.4 Heads of department

- Ensure all relevant staff members are aware of this National Clinical Guideline.
- Monitor local implementation of the guideline and its outcomes.
- Ensure staff are supported to undertake the associated education programme as appropriate.

1.11.5 All healthcare staff

All healthcare staff are responsible and accountable, within their professional scope of practice, for adhering to this National Clinical Guideline and for maintaining competence in communication (clinical handover) of patient care. All healthcare staff must be aware of the role of appropriate delegation in using this guideline.

1.11.6 Education providers

Education providers with responsibility to provide preparatory professional education, continuing education and professional development for all healthcare professionals are responsible for incorporating communication (clinical handover) practice within curricula.

1.12 Audit criteria

To ensure that this guideline positively impacts on patient care, it is important that implementation is audited. Audit is recommended to support continuous quality improvement in relation to the implementation of the National Clinical Guideline.

Audit tool templates have been developed to assist the audit of communication (clinical handover) practice (Appendix 8).

2 National Clinical Guideline recommendations

2.1 National recommendations

The basis for level of evidence and grade of recommendations are presented in tables 1.8.1 and 1.8.2. Where existing guidance is used to support a recommendation, the National Quality Assurance Criteria Score (HIQA 2011; NCEC 2013) is reported in square parentheses, thus '[]'. If a score was not applied this is reported as [N/A]. Where the empirical literature used to inform a recommendation is not reported in the text preceding the recommendation, it is directly referenced. Where existing guidance is the only source used to guide a recommendation, this is specified. A rationale for the recommendations is outlined and practical guidance to support the delivery of the recommendations is provided.

The recommendations are numbered 1 to 30 and are linked to the best available evidence and/or expert opinion. They are divided under the following topics:

1. Organisational changes (recommendations 1-9) **2. Clinical handover conduct (recommendations 10-24)** **3. Clinical handover content (recommendations 25-28)** **4. Additional Recommendations (recommendations 29-30)**
Organisational Recommendations (1-9) • Recognition of clinical handover as a clinical risk activity. • Guidance. • Education and training. • Information giving and seeking. • Accessing information. **Clinical Handover Conduct (10-24)** • Shift clinical handover. • Inclusion of all patients in the ward/unit at shift clinical handover. • Protected area. • Protected time for inter-departmental clinical handover. • Mandatory protected time for shift clinical handover. • Clear transfer of responsibility for the patient. • Designation a lead healthcare professional to manage clinical handover. • Clarification of staff roles and responsibilities for clinical handover. • Clinical handover process. • Safety Pause. • Radiology. • Laboratory. • Patient/carer involvement. **Clinical Handover Content (25-28)** • Shift clinical handover - structured format/common language. • Inter-department clinical handover - structured format. • Electronic clinical handover applications/templates. • Communication of patient deterioration. **Additional Recommendations (29-30)** • Education and training. • Guideline implementation.

Maternity hospitals need to have systems in place to address all elements in the National Clinical Guideline. Due consideration of the application of the recommendations for individual hospitals/units specific circumstances is required.

2.2 Organisational recommendations

2.2.1 Recognition of clinical handover as a clinical risk activity

The following are responsible for implementation of recommendation 1:
CEO/General Manager/Hospital Manager of the healthcare organisation.

Recommendation 1: Healthcare organisations recognise clinical handover as a clinical risk activity, and incorporate clinical handover into their risk register.
Level of Evidence: 3
Grade of Recommendation: D

Practical Guidance
Healthcare organisations should incorporate clinical handover into their corporate and local risk register. The GDG recognise that on-going care and patient safety must be ensured during the clinical handover period.

The following are responsible for implementation of recommendation 2:
All healthcare staff.

Recommendation 2: Participation at clinical handover should take priority over all other work except emergencies.
Level of Evidence: 3
Grade of Recommendation: D

Rationale
Ineffective communication between healthcare staff has been increasingly recognised as a factor which can contribute to patient safety incidents (White *et al.* 2005; Greenberg *et al.* 2007; Kachalia *et al.* 2007; Singh *et al.* 2007; Pezzolesi *et al.* 2010; Jones *et al.* 2011; Rabol *et al.* 2011; Bongaerts *et al.* 2012). Mistakes made during shift clinical handover may lead to negative effects in the subsequent shift (Horwitz *et al.* 2008). While health professionals are often aware of how a poor quality clinical handover can negatively impact on patient care (Sutcliffe *et al.* 2004; McCann *et al.* 2007; Sharit *et al.* 2008; Horwitz *et al.* 2009), they may also believe that errors at clinical handover are 'caught' by other professionals in the care process, and therefore believe that no detrimental harm results for the patient (Philibert *et al.* 2009). Health professionals have been observed to rate the same clinical handover event differently depending on: their speciality (McCrory *et al.* 2011), experience or relative position in the hierarchy (Reader *et al.* 2007), role as sender or receiver (Reader *et al.* 2007; Carroll *et al.* 2012), or the existing relationship between the two parties, including the level of mutual trust (Philibert *et al.* 2009; Bost *et al.* 2012; Carroll *et al.* 2012). They have also been observed to overestimate the quality of their own clinical handovers, rating them highly in spite of the absence of data elements and the prevalence of interruptions (Woloshynowych *et al.* 2007; Chang *et al.* 2010; Bost *et al.* 2012; Carroll et al. 2012). They may not be aware of clinical handover as a high-risk process if their organisation does not present it as such (Siemsen *et al.* 2012). In *Good Practice in Handover*, the Royal College of Paediatrics and Child Health (2005) states that each healthcare organisation should identify which staff are relevant to attend shift clinical handover, including grades and specialties, and that attendance at clinical handover should take priority over all other work except emergencies. Physicians have indicated that sign-out could be improved by educating staff on the importance of information transfer and highlighting its potential impact on patient safety (Sharit *et al.* 2008).

The national survey commissioned by the GDG (Appendix 6) identified that the vast majority of hospitals/units (93%) reported that they considered clinical handover to be a high risk activity.

2.2.2 Guidance

The following are responsible for implementation of recommendations 3-6:
CEO/General Manager/Hospital Manager of the healthcare organisation.

Recommendation 3: Healthcare organisations review existing organisational clinical handover guidance (policies, procedures and guidelines) in collaboration with appropriate stakeholders, including healthcare staff, patients and their carers.
Level of Evidence: Existing guidance
Grade of recommendation: D
References: NSW Department of Health, 2009 [N/A]; Australian Commission on Safety and Quality in Health Care, 2012 [N/A]

Practical Guidance
Review of existing organisational clinical handover guidance is an essential step to provide the opportunity to reflect on current processes and to effectively implement Recommendations 4-6.

Recommendation 4: Healthcare organisations develop a local policy in compliance with the National Clinical Guideline, in relation to clinical handover following consultation with relevant stakeholders.
Level of Evidence: 3
Grade of recommendation: D
Reference: Department of Health (South Australia), 2013a, 2013b) [3]; Australian Commission on Safety and Quality in Health Care, 2012 [N/A]; Royal College of Obstetricians

Recommendation 5: Local clinical handover policies must be developed in compliance with the National Clinical Guideline. While national communication tools (templates) are included in the National Clinical Guideline, these templates may be customised locally to accommodate features of the healthcare organisation, individual department, ward or unit, in line with the concept of 'flexible standardisation'.
Level of Evidence: Existing guidance
Grade of recommendation: D
References: Australian Commission on Safety and Quality in Health Care (2010) [N/A]; Australia Healthcare and Hospitals Association (2009); [N/A]

Practical Guidance
Note: Flexible standardisation: The idea that effective clinical handover involves local interpretation of a standard in order to accommodate contextual factors (Australian Healthcare and Hospitals Association, 2009; Australian Commission on Safety and Quality in Health Care, 2013). This principle is particularly relevant to inter-departmental clinical handovers. The literature suggests that clinical handovers occurring between units should be approached somewhat differently to intra-departmental clinical handovers, including shift change clinical handover, since they require a greater degree of negotiation and collaboration between specialities and professions, whose priorities and information requirements can differ greatly (Beach *et al.* 2012; Hilligoss and Cohen, 2013).

Templates for ISBAR and $ISBAR_3$ communication tools (Appendix 9) should be adjusted for specific clinical circumstances such as the addition of a surgical check list for surgical areas as appropriate.

Recommendation 6: Clinical handover practice is audited and monitored by the relevant quality and safety committee of the healthcare organisation. It is the responsibility of the chair of this committee to assure the CEO/General Manager that the audit is undertaken and any necessary continuous quality improvement plans are put in place.
Level of Evidence: Existing guidance
Grade of recommendation: D
Reference: Department of Health (South Australia), 2013a [3] Commission on Safety and Quality in Health Care, 2013 [N/A]

Practical Guidance
Audit tool templates for ISBAR, $ISBAR_3$ and organisation compliance with the National Clinical Guideline are available in Appendix 8 and can be amended as appropriate.

Rationale
Several studies have indicated that there is often no clear mechanism or protocol to guide staff during clinical handover (Roughton *et al.* 1996; Thakore and Morrison, 2001; Bomba and Prakash, 2005; McFetridge *et al.* 2007; Ye *et al.* 2007; Lawrence *et al.* 2008; Chen *et al.* 2011; Wright *et al.* 2011; Keenan *et al.* 2013). Multi-disciplinary staff have identified the absence of formal clinical handover policy as a barrier to an effective clinical handover process (Siemsen *et al.* 2012). Guidance from the UK (Royal College of Obstetricians and Gynaecologists, 2010) and Australia (Australian Commission on Safety and Quality in Health Care, 2012; Department of Health South Australia, 2013a, 2013b; Department of Health (Western Australia), 2013) outline the need for clear clinical handover protocols to be developed and reviewed, at the level of the healthcare organisation.

The findings from the focus group discussions and interviews with healthcare staff commissioned by the GDG (Appendix 6) indicate that healthcare staff perceived that there was little formal policy regarding the way that clinical handover should be conducted.

2.2.3 Education and training

The following are responsible for implementation of recommendation 7:
CEO/General Manager/Hospital Manager of the healthcare organisation.

Recommendation 7: Healthcare organisations provide staff with education and training for their clinical handover policy. This should be mandatory and form part of staff orientation and ongoing in-service education.
Level of Evidence: Existing guidance
Grade of recommendation: D
References: Department of Health (South Australia), 2013a [3]; Department of Health (Western Australia), 2013 [3]

Practical Guidance
Healthcare organisations should provide education and training on communication (clinical handover) to healthcare professionals together where possible.

Rationale
Despite the frequency with which clinical handover occurs in the hospital setting, physicians in the UK (Health Foundation, 2011) and US (Horwitz *et al*. 2006) have identified a lack of training and education as a barrier to an effective process. The Western Australia, Department of Health (2013) clinical handover policy requires staff to be educated and trained in site policies in relation to clinical handover, and staff training in clinical handover, communication and teamwork is

stipulated in the South Australia Department of Health handover guideline (2010). Guidance suggests that training should be included as part of orientation (Department of Health (South Australia), 2013a) and that junior staff should be trained in how to conduct shift clinical handovers before they lead or initiate them (Department of Health (Western Australia), 2013). This is equally important in undergraduate training (Gordon 2013).

2.2.4 Information transfer

The following are responsible for implementation of recommendation 8:
CEO/General Manager/Hospital Manager of the healthcare organisation.

Recommendation 8: Healthcare organisations should incorporate Human Factors Training into all clinical handover education and training, and promote a culture of mutual respect between professionals.
Level of Evidence: 3
Grade of recommendation: D
Reference: HSE Code of Standards and Behaviour (2009)

Practical Guidance
Human factors refer to environmental, organisational and job factors, and human and individual characteristics which influence behaviour at work in a way which can affect health and safety (WHO, 2009). Human Factors Training will foster an environment of questioning and promote confidence of staff. This should include training in assertiveness and effective communication methodologies in order to promote a culture of openness in the interest of patient safety and quality.

Rationale
Communication between professionals may tend towards information-giving rather than information-seeking, with limited opportunities for questions (Apker *et al.* 2007; Welsh *et al.* 2010; Greenstein *et al*. 2011) and the willingness to engage in clinical handover communication as a two-way process may differ between professional groups (Randell *et al*. 2012), depend on their role as sender or receiver (Reader *et al.* 2007), or their level of experience and relative position within professional hierarchies (Reader *et al.* 2007; Sharit *et al.* 2008; Carroll *et al.* 2012). Existing hierarchies (Carroll *et al.* 2012) and staff relationships coupled with limited opportunity or time (Welsh *et al.* 2010) may affect the degree to which staff ask questions during clinical handover. Encouraging staff assertiveness is a recommended strategy for improving communication effectiveness within high reliability organisations (Leonard *et al.* 2004; Brindley and Reynolds, 2011). Staff have indicated the need to foster respect between professionals so that hierarchies and professional relationships do not impede the successful adoption of a new clinical handover process (Siemsen *et al.* 2012). A protocol which requires staff to state their role, share opinions with and elicit feedback from other team members, may not succeed due to long-standing hierarchical structures (Rice *et al.* 2010).

2.2.5 Accessing information

The following are responsible for implementation of recommendation 9:
CEO/General Manager/Hospital Manager of the healthcare organisation.

Recommendation 9: Healthcare organisations ensure that all staff have access to relevant, accurate and up to date sources of information during clinical handover. Electronic patient records, including diagnostic data, should be considered as a solution for providing relevant, accurate and up to date information for clinical handover.
Level of Evidence: 3
Grade of recommendation: D
References: British Medical Association, 2004 [3]; Department of Health (Western Australia), 2013 [3]; Department of Health (South Australia), 2013a [3]

Practical Guidance
In terms of electronic patient records a collaborative national approach should be taken.

Rationale
Health professionals working in the hospital setting often report problems with accessing information (Wilson, *et al.* 2005; Astrom, *et al.* 2007; Grobman *et al.* 2011; Health Foundation, 2011; Siemsen *et al.* 2012), identifying this as a barrier to an effective clinical handover process (Grobman *et al.* 2011; Siemsen *et al.* 2012). Ensuring the IT infrastructure is capable of supporting staff communication and providing updated information is recommended in existing guidance (British Medical Association, 2004, Royal College of Physicians, 2004, Department of Health (Western Australia), 2013). This guidance recommends that professionals conduct shift clinical handover where there is easy access to information (British Medical Association, 2004; Department of Health (Western Australia), 2013). Where appropriate, this information should include patient lists and laboratory and radiology data (Department of Health (South Australia), 2013a).

Using an electronically-generated template (Pickering *et al*. 2009; Ahmed *et al.* 2012; Dubosh *et al.* 2012; Payne *et al.* 2012) or template integrated and populated with data from the EMR (Anderson *et al*. 2010; Graham *et al.* 2013) has been associated with improvements in data recording (Anderson *et al*. 2010; Ahmed *et al*. 2012), fewer omissions (Graham *et al.* 2013), and improved accuracy of patient information recall (Pickering *et al*. 2009) at shift clinical handover. Auto-populated templates have been associated with reduced time spent preparing for clinical handover (Van Eaton *et al.* 2005; Anderson *et al.* 2010; Kochendorfer *et al.* 2010).

2.3 Clinical handover conduct

2.3.1 Shift clinical handover

The following are responsible for implementation of recommendation 10:
CEO/General Manager/Hospital Manager/Clinical Lead/Director of Nursing and/or Midwifery of the healthcare organisation.

Recommendation 10: The healthcare organisation should implement multidisciplinary shift clinical handover where possible, to include junior and senior staff at every clinical handover during the 24 hour cycle.
Level of Evidence: 3
Grade of recommendation: D
References: British Medical Association, 2004 [3]; Department of Health (Western Australia), 2013 [3]

Practical Guidance
Co-ordination of rostering for multidisciplinary team members, within organisations, may provide an opportunity to achieve multidisciplinary team shift handover.

The following are responsible for implementation of recommendation 11:
CEO/General Manager/Hospital Manager/Clinical Lead/Director of Nursing and/or Midwifery of the healthcare organisation.

Recommendation 11: Shift clinical handover should incorporate a discussion around operational issues and identify factors that may impact on clinical care.
Level of Evidence: 3
Grade of recommendation: D

Practical Guidance
Concerns in relation to operational issues should be escalated to senior hospital management in line with the agreed organisational processes. Refer to recommendation 21 for further detail on the Safety Pause which can be utilised for risk assessment as appropriate. An example of operational issues could be bed/cot availability, increased risk of cross-infection, staffing, etc.

Rationale
Clinical handover at shift change can provide an opportunity to spot and mitigate errors (Randell *et al*. 2012) and is also an education and training opportunity (Royal College of Physicians and Royal College of Nursing, 2012). A cross-sectional survey of Irish hospitals (Murphy *et al.* 2011) indicated that clinical problems and new admissions were discussed most frequently during clinical handover rounds, while bed management and risk management were discussed less frequently. However, shift clinical handover can provide a valuable platform for communication about operational issues (Farhan *et al.* 2010; Randell *et al.* 2012) and effective communication of operational issues may improve the quality of care delivered in the subsequent shift (Farhan *et al.* 2010).

Including different professions and disciplines at clinical handover may expand the range of expertise and knowledge present, enhancing the purpose of clinical handover. Irish physicians have suggested that expanded multidisciplinary attendance, including post-call staff at a senior-led clinical handover round, may be a way to improve the process (Murphy *et al.* 2011). Existing guidance recommends that shift clinical handover be multidisciplinary and interprofessional, where feasible (Department of Health (Western Australia), 2013) and include different staff grades, where possible (Royal College of Physicians, 2004; Royal College of Physicians and Royal College of Nursing, 2012). The British Medical Association (2004) suggests that, while it may be more appropriate for unit clinical handovers to be conducted on a smaller scale involving relevant staff, day to night shift clinical handover should be multidisciplinary.

2.3.2 Inclusion of all patients in the clinical handover report

The following are responsible for implementation of recommendation 12:
All healthcare staff in the healthcare organisation.

> **Recommendation 12:** All patients in the ward/unit must be discussed at shift clinical handover.
> **Level of Evidence:** 4
> **Grade of recommendation:** D

Rationale
The fieldwork, commissioned and conducted by the GDG to inform this guideline (Appendix 6), identified gaps in this practice.

2.3.3 Protected area

The following are responsible for implementation of recommendation 13:
CEO/General Manager/Hospital Manager and Clinical Director of the healthcare organisation/ Director of Nursing and/or Midwifery.

> **Recommendation 13:** Clinical handover is conducted in an area with minimal distractions and interruptions and the organisation should determine how this may be best accommodated at the ward/unit level.
> **Level of Evidence:** 3
> **Grade of recommendation:** D
> **References:** British Medical Association, 2004 [3]; Department of Health (Western Australia), 2013 [3]; NSW Department of Health, 2009 [N/A]

> **Practical Guidance**
> Healthcare organisations should consider relocating clinical handover to achieve recommendation 13 this with minimal distractions and interruptions where appropriate.

Rationale
Communication processes in the hospital setting are frequently interrupted (Coiera and Tombs, 1998; Lawrence *et al.* 2008; Sharit *et al.* 2008; Welsh *et al.* 2010; Aase *et al.* 2011; McSweeney *et al.* 2011; Bost *et al.* 2012; Poot *et al.* 2013). Minimising interruptions (Sharit *et al.* 2008; Klim *et al.* 2013; Poot *et al.* 2013) and conducting shift clinical handover in a designated location (McCann *et al.* 2007) has been associated with improved staff perceptions of clinical handover quality. A cross-sectional survey of Irish doctors (Murphy *et al.* 2011) indicated that the bedside was the preferred location for clinical handover rounds, with a meeting room being the next most preferable location. Existing guidance recommends that healthcare organisations designate a suitable environment for clinical handover, one that is free from distractions (British Medical Association, 2004; NSW Department of Health, 2009; Department of Health (Western Australia), 2013). Guidance from the SA Department of Health on handover (2013a) recommends that interruptions to clinical handover should be minimised and organisational strategies developed to achieve this.

Multi-component shift clinical handover protocols that have relocated clinical handover (Starmer *et al.* 2013), specified that clinical handover should be conducted in a non-clinical environment (Sadri *et al.* 2014) or designated care area; managed interruptions (Okafor *et al.* 2013) have resulted in reduced medical error rates (Okafor *et al.* 2013; Starmer *et al.* 2013) and improved completeness of information handed over (Sadri *et al.* 2014). However, specifying the use of a

distraction-free area does not necessarily ensure that non-essential interruptions will not occur (Chen *et al.* 2011).

The findings from the non-participant clinical handover observation of clinical handover study commissioned by the GDG (Appendix 6) noted that interruptions occurred in 9 out of 10 observed clinical handover events. In total 57 interruptions occurred in 9 clinical handovers. The mean number of interruptions was 6 and the maximum observed interruptions in 1 clinical handover event was 15. In addition one midwife identified this as a barrier to effective clinical handover and suggested that constant 'interruptions could limit the amount of information transferred'.

The findings from the service user focus group study commissioned by the GDG (Appendix 6) identified a preference for 'frequent updates quietly at the bedside' or 'in a small private room where sensitive matters were being communicated and discussed'.

2.3.4 Protected time for inter-departmental clinical handover

The following are responsible for implementation of recommendation 14:
CEO/General Manager/Hospital Manager/Clinical Director/Director of Nursing and/or Midwifery of the healthcare organisation.

Recommendation 14: Protected time should be designated for inter-departmental clinical handovers.
Level of Evidence: 3
Grade of recommendation: D

Practical Guidance
Inter-departmental relates to patient transfer between departments within a hospital or between two hospitals, e.g. ward to ICU within the same hospital or a different hospital.

Rationale
Staff report that insufficient time during clinical handover is a barrier to an effective clinical handover process (Siemsen *et al.* 2012) and this can lead to truncated or omitted information being handed over (Horwitz *et al.* 2009a). When staff need to multitask they cannot fully focus on clinical handover, which may cause delays, particularly during inter-departmental clinical handovers (Jenkin *et al.* 2007; Smith *et al.* 2008; Owen *et al.* 2009). Existing time pressure during interactions may preclude staff from engaging in questions, offering opinions and eliciting feedback even if this is stipulated in a protocol (Rice *et al.* 2010). Catchpole et al (2007) found that the introduction of the new clinical handover protocol led to improvements in all aspects of the clinical handover including duration of clinical handover which was reduced from 10.8 min (95% CI +/-1.6) to 9.4 min (95% CI +/-1.29). Dr. Ciaran McLoughlin, in his recommendations following the inquest into the death of Savita Halappanavar, stated that 'proper and effective communication to occur between staff on-call and a team coming on duty and a dedicated clinical handover time is set aside for such communications'. The GDG consider this a significant concern in the context of the European Working Time Directive.

2.3.5 Protected time for shift clinical handover

The following are responsible for implementation of recommendation 15:
CEO/General Manager/Hospital Manager/Clinical Director/Director of Nursing and/or Midwifery of the healthcare organisation.

Recommendation 15: The healthcare organisation should ensure that there is mandatory protected time for shift clinical handover.
Level of Evidence: 3
Grade of recommendation: D
References: Australian Resource Centre for Healthcare Innovations, 2013 [N/A]; British Medical Association, 2004 [3]; Department of Health (Western Australia), 2013 [3].

Practical Guidance
Healthcare organisations should give consideration to the most appropriate way to achieve this recommendation within their own organisation. Specific consideration should be given to clinical handover practice for NCHDs, due to the changing work patterns for this group. This could be facilitated by scheduling overlapping shifts, and mandating staff attendance.

Rationale
Guidance from professional bodies has recommended that a specific time should be designated for shift clinical handover (British Medical Association, 2004; Royal College of Physicians, 2004; Royal College of Paediatrics and Child Health, 2005; Royal College of Surgeons of England, 2007; Australian Commission on Safety and Quality in Health Care, 2012; Australian Resource Centre for Healthcare Innovations, 2013). This should be facilitated by overlapping shifts (British Medical Association, 2004; NSW Department of Health, 2010; Department of Health (Western Australia), 2013); physicians have identified that a failure to provide protected time acts as a barrier to effective shift clinical handover (Health Foundation, 2011). Guidance also recommends that organisational policies should stipulate that clinical handover attendance take precedence over all other work, except emergencies (Royal College of Paediatrics and Child Health, 2005; Department of Health (Western Australia) 2013).

2.3.6 Clear transfer of responsibility for the patient

The following are responsible for implementation of recommendations 16-17:
CEO/General Manager/Hospital Manager of the healthcare organisation.

Recommendation 16: The healthcare organisation's policy on communication (clinical handover) is explicit and clear about the transfer of responsibility during and following **inter-departmental** clinical handover. Clinical responsibility can only be transferred when responsibility is accepted by the team to which the patient is being referred.
Level of Evidence: 3
Grade of recommendation: D
References: Department of Health (Western Australia) 2013 [3]; NSW Department of Health, 2009 [N/A]

Practical Guidance
The point at which responsibility is transferred and accepted needs to be agreed between both departments/parties, be explicit and be formally documented. Clinicians, accepting responsibility for patients, must conduct their own clinical assessment of patients to confirm, as appropriate to the clinicians' role and responsibilities, clinical diagnosis and treatment plans provided during clinical handover.

Recommendation 17: The healthcare organisation's policy on communication (clinical handover) must be explicit and clear about the transfer of responsibility during and following **shift clinical handover**. Clinicians, accepting responsibility for patients, must conduct their own clinical assessment of patients.
Level of Evidence: 3
Grade of recommendation: D
References: Department of Health (Western Australia) 2013 [3]; NSW Department of Health, 2009 [N/A]

Practical Guidance
The point at which responsibility is transferred during shift clinical handover needs to be agreed between both parties, be explicit and be formally documented. Clinicians, accepting responsibility for patients, must conduct their own clinical assessment of patients to confirm, as appropriate to the clinicians' role and responsibilities, clinical diagnosis and treatment plans provided during clinical handover.

Rationale
Staff report that the transfer of responsibility for the patient during clinical handover is often ambiguous (Bomba and Prakash, 2005; Williams *et al.* 2007; Wayne *et al.* 2008; Philibert *et al*. 2009; Bost *et al.* 2012; Chin *et al.* 2012) and this may lead to issues in relation the follow up of test results (Horwitz *et al.* 2009a) or instances where patients are handed over to a new unit without a clinician being assigned responsibility (Li *et al.* 2011). A lack of formal documentation to confirm that inter-departmental clinical handover (Smith *et al.* 2008) or shift clinical handover has occurred (Wayne *et al.* 2008) may be one reason why the transfer of information does not always imply responsibility transfer for staff. Clarity on locus of responsibility for patients is viewed as essential in assuring an effective clinical handover process. Siemsen *et al*, 2012 suggest that the transfer of responsibility during communication needs to be made explicit and clear, to the extent that all clinicians are aware of who is responsible for patients during and following a clinical handover report. Staff involved in the clinical handover process may need to agree the point of responsibility transfer based on what is most appropriate locally. Existing guidance recommends that the clinician receiving clinical handover fully comprehends, acknowledges and accepts responsibility for the patient (Department of Health (South Australia), 2013a) and that staff need to be made fully aware that responsibility is transferred along with information (Department of Health (Western Australia), 2013). New South Wales Health (NSW Health 2009) indicates that signing over of clinical handover sheets may be a strategy to achieve clarity around responsibility. The new Emergency Medicine Programme Handover Protocol (HSE 2013) clarifies the point at which responsibility for patient care has passed to the receiving ED staff, stipulating that this has occurred only when both the clinical information *and* the patient have moved into the ED facility. The protocol also stipulates that staff provide verbal acknowledgment that clinical handover is finished. Transfer of responsibility is also reported to be ambiguous in the context of shift change (Wayne *et al.* 2008; Philibert *et al.* 2009; Chin *et al.* 2012).

2.3.7 Lead healthcare professional to manage clinical handover

The following are responsible for implementation of recommendations 18:
The Clinical Director/Director of Nursing and/or Midwifery for the healthcare organisation.

Recommendation 18: Clinical handover policies should designate a lead healthcare professional to manage the inter-departmental clinical handover and the shift clinical handover process.
Level of Evidence: 2-
Grade of recommendation: D
References: Department of Health (Western Australia), 2013 [3]; British Medical Association, 2004 [3]; NSW Department of Health, 2009; Department of Health (South Australia), 2013a [3]

Rationale

Defining leadership responsibility during inter-departmental clinical handover has been shown to be successful in improving the process of clinical handover from Operating Room (OR) to Paediatric Intensive Care Unit (PICU) (Catchpole *et al*. 2013; Vergales *et al.* 2014). Specifying supervision by senior clinicians during shift clinical handover has formed a component of clinical handover protocols, which have been associated with a reduction in medical error rates and omissions (Starmer *et al*. 2013) and an increase in the completeness of information handed over (Sadri *et al.* 2014). Australian standards outline clear leadership as one of its key clinical handover principles (NSW Department of Health, 2009) and guidance recommends that a leader be nominated to manage discussions during clinical handover (British Medical Association, 2004; NSW Department of Health, 2009). Ideally, this would be the most senior clinician (Department of Health (Western Australia) 2013). This individual should have a clear and full understanding of the clinical handover process and be responsible for ensuring all participants are present and that conversations are managed (NSW Department of Health, 2009).

2.3.8 Clarify staff roles and responsibilities for clinical handover

The following are responsible for implementation of recommendation 19:

CEO/General Manager/Hospital Manager of the healthcare organisation.

Recommendation 19: Clinical handover policies should specify staff attendance, roles and responsibilities at clinical handover.
Level of Evidence: 3
Grade of recommendation: D
References: Department of Health (Western Australia), 2013 [3]; British Medical Association, 2004 [3]

Practical Guidance
Clinical handover policies should be decided in consultation with relevant healthcare staff.

Rationale

Communication failures have been observed to arise when a key individual is missing from the conversation (Hu *et al.* 2012), i.e., staff may be not aware of the importance of their presence during a particular communication event. Existing guidance suggests that staff roles and responsibilities during clinical handover should be clarified (British Medical Association, 2004; Department of Health (Western Australia), 2013). Defining task responsibility during inter-departmental clinical handover has formed part of successful clinical handover protocol from OR to PICU/ICU (Olm-Shipman *et al.* 2011; Catchpole *et al*. 2013; Vergales *et al.* 2014), although the extent to which a protocol such as this can be successfully adopted may depend on existing 'habits' of professional interactions, along with time constraints (Aase *et al*. 2011).

The Joint Commission (USA) (2007) identified that timely, accurate, complete and unambiguous information that is understood by the recipient, reduces errors and results in improved patient safety.

Existing guidance recommends that the clinician receiving clinical handover fully comprehends, acknowledges and accepts responsibility for the patient (Department of Health (South Australia), 2013a) and that staff need to be made fully aware that responsibility is transferred along with information (Department of Health (Western Australia), 2013).

Guidance suggests that clinical handover should be a two-way, reciprocal process (British Medical Association, 2004; Department of Health (South Australia), 2013a). Face-to-face communication facilitates this, allowing information to be questioned and clarified. When opportunities for

questions and verification are present during shift clinical handover, health professionals have been observed to correct error and contribute to the exchange of information (Randell *et al*. 2012).

2.3.9 Clinical handover process

The following are responsible for implementation of recommendation 20:
All healthcare staff in the healthcare organisation.

Recommendation 20: Clinical handover should be conducted:
1) face-to-face where possible, (**Level of Evidence**, 3: **Grade of Recommendation**, D)
2) verbally, (**Level of Evidence**, 2++, **Grade of Recommendation**, C).
3) be supported with relevant documentation (**Level of Evidence** 2++, **Grade of Recommendation**, C).

Taped clinical handover must **NOT** be used in any circumstances (**Level of Evidence**, Existing guidance only, **Grade of Recommendation.** D).
References: British Medical Association, 2004 [3]; Royal College of Surgeons of England, 2007; Department of Health, South Australia, 2013a [3]; New South Wales Department of Health, 2009.

Practical Guidance
It is recognised that there are occasions where 'face-to-face' clinical handover is not feasible. Clinicians should recognise that there is increased risk with this method and utilise all available tools to reduce this risk and enhance the quality of the clinical handover.

Rationale
Studies indicate that health professionals believe that conducting communication and clinical handover face-to-face is more reliable (Arora *et al.* 2005; Philibert *et al*. 2009; Siemsen *et al.* 2012). Guidance suggests that clinical handover should be a two-way, reciprocal process (British Medical Association, 2004; Department of Health (South Australia), 2013a). Face-to-face communication facilitates this, allowing information to be questioned and clarified. When opportunities for questions and verification are present during shift clinical handover, health professionals have been observed to correct error and contribute to the exchange of information (Randell *et al*. 2012). If multiple staff members are present during face-to-face clinical handover, guidance recommends that just one individual should speak at a time, avoiding concurrent conversations (British Medical Association, 2004; Royal College of Surgeons of England, 2007). This recommendation is also stipulated in the Emergency Medicine Programme clinical handover protocol (HSE 2013).

Including a requirement for direct communication between laboratory and clinical staff when reporting test results, instead of merely reporting through the Electronic Medical Record, has been used to improve the process (Johnson *et al.* 2011). However, verbal communication in isolation has been identified as a mode which is vulnerable to error (Pothier *et al.* 2005; Bhabra *et al.* 2007; Ong and Coiera, 2010; Craig *et al.* 2012b), as it places too much burden on memory (Astrom *et al.* 2007). Omissions have been observed to occur less frequently among physicians who also use the Electronic Medical Record or make notes during clinical handover, rather than relying solely on verbal processes (Maughan *et al.* 2011), and recall of clinical handover information has been observed to improve when aided by a printed template (Pickering *et al.* 2009). Existing guidance recommends that clinical handover be conducted verbally and supported by written documentation (British Medical Association, 2004; NSW Department of Health, 2009; South Australia Department of Health 2010; Department of Health (Western Australia), 2013) and that staff be made aware of the documentation they need to hand over in specific scenarios (Australian Commission on Safety and Quality in Healthcare, 2010). According to guidance from

South Australia Department of Health (2010), and the NSW Department of Health (2009), taped clinical handover is not considered an appropriate mode for any scenario.

2.3.10 Safety Pause

The following are responsible for implementation of recommendation 21:
CEO/General Manager/Hospital Manager of the healthcare organisation/All healthcare staff.

Recommendation 21:
The Safety Pause should be utilised during shift clinical handover to provide an opportunity to clarify and discuss any aspect of a patient's care.
Level of Evidence: 4
Grade of recommendation: D
References: The Safety Pause: Information Sheet (HSE) (2013) (Appendix 10)

Practical Guidance
Additional information on the Safety Pause is provided on the Safety Pause Information Sheet (2013), along with examples of safety issues that may arise, in Appendix 10.

Rationale
The findings from the focus group discussions and interviews, commissioned by the GDG, identified that the Safety Pause is incorporated into clinical handover in some hospitals at present. It was the consensus of the GDG that this should be adopted nationally as part of clinical handover.

The Safety Pause is a very important feature of clinical handover as it provides an opportunity for staff to pause and highlight safety issues which may assist them in being proactive about the challenges they face in providing safe high quality care for patients. Emphasis on the Safety Pause as part of clinical handover has the potential to have a profound effect on patient safety in Maternity Services by focussing staff's attention on priority issues that everyone needs to know to maintain patient safety. It is based on one question '*what patient safety issues do we need to be aware of today*' – resulting in immediate actions.

2.3.11 Radiology

The following are responsible for implementation of recommendation 22:
CEO/General Manager/Hospital Manager of the healthcare facility.

Recommendation 22:
The Faculty of Radiology's QA Guidelines for the management of Critical, Urgent and Clinically Significant and Unexpected radiological findings should be implemented in all locations. Consideration should be given to the utilisation of electronic solutions for:
a) Critical and Urgent results (as an adjunct to, and documentation of, direct voice to voice or face-to-face communication), and
b) Clinically Significant and Unexpected findings (where direct communication is not the standard) requiring follow-up.
Level of Evidence: 4
Grade of recommendation: D

Practical Guidance
PeerVue software is part of the NIMIS system and was recently purchased by the HSE. This software is currently being installed in public hospitals. The system permits radiologists to issue "Alerts" to Clinicians with varying levels of urgency. The system does not replace the conventional report as issued for all radiological investigations. Additional information on PeerVue is available in Appendix 11.

Rationale
The interviews conducted with radiologists identified that this system has been developed for use in the Irish context.

It was the consensus of the GDG to recommend full implementation of this system nationally. Identification of implementation requirements around the PeerVue system is the responsibility of the National QA Programme in Histopathology and Radiology Steering Committee, RCPI.

Where these systems are not in use, this should be incorporated in the healthcare organisation's corporate and local risk registers

2.3.12 Laboratory

The following are responsible for implementation of recommendation 23:
Acute Hospital Services HSE/CEO/General Manager/Hospital Manager of the healthcare facility.

Recommendation 23:
Laboratories should have policies and assurance processes in place for clinical handover of critical results. A national medical laboratory information system solution would greatly facilitate the reporting of critical laboratory results and should be implemented nationally.
Level of Evidence: 4
Grade of recommendation: D

Practical Guidance
The purpose of the National MedLIS Project is to deliver a single national standardised laboratory information system, replacing the multiple disparate systems currently in use. Governance and implementation requirements around the MedLIS system is the responsibility of the National Medical Laboratory (MedLis) Project Board. Where the MedLIS system is not in use, this should be incorporated in the healthcare organisation's corporate and local risk registers.

Refer to Appendix 12 for overview of MedLIS. Education and training are key vehicles in the clinical handover pathway. It is recognised that there is often a knowledge gap regarding laboratory results where staff receiving results are not always aware of the importance of the results. The involvement of laboratory staff in multi-disciplinary team 'huddles' etc. may provide this education.

Rationale
It was the consensus of the GDG to recommend full implementation of this system nationally.

2.3.13 Patient/carer involvement

The following are responsible for implementation of recommendation 24:
CEO/General Manager/Hospital Manager and Lead Clinician of the healthcare organisation.

Recommendation 24:
The healthcare organisation should aim to involve the patient and/or carer(s) in the clinical handover process, ensuring that the patient and/or carer(s) are provided with up to date factual information in relation to the patient's condition, care and treatment, encouraging and taking into consideration their preferences whilst also meeting the requirements of confidentiality. The healthcare organisation should determine how this may be best accommodated at unit level.
Level of Evidence: 3
Grade of recommendation: D
References: Barker, 2013 [5]; Department of Health (South Australia), 2013a [3]; Department of Health (Western Australia), 2013 [3]

Rationale
Physicians have proposed that when clinical handover occurs at the bedside, important visual cues and context can improve the quality of the exchange (Sharit *et al.* 2008). Existing guidance from Australia recommends that patient and carer involvement in clinical handover should be promoted by conducting face-to-face clinical handover at bedside, if appropriate, as this can allow information to be further verified or questioned by the patient (Department of Health (South Australia), 2013a; Department of Health (Western Australia), 2013). The practice of bedside clinical handover has been primarily supported with reference to nursing shift clinical handover (Australian Commission on Safety and Quality in Health Care, 2010; Agency for Healthcare Research and Quality, 2013; Barker, 2013; Queensland Health, 2013; Sherman *et al.* 2013). The

advantages of bedside nursing clinical handover, as reported in a review by Sherman *et al.* (2013), include increased patient satisfaction, improvements in the nurse/patient relationship, improved report efficiency and reporting accuracy, and better prioritisation at the start of shift. However bedside shift clinical handover may take longer, patients may have difficulty with medical jargon, experience anxiety from too much or incorrect information, or due to hearing about their illness, or express concern about privacy (Sherman *et al.* 2013). As such, professional judgement is needed with regard to the information appropriate to handover at the bedside, giving due regard to patient privacy and confidentiality (NSW Department of Health, 2009). Recommended strategies to achieve bedside clinical handover include handing over sensitive information like test results, psychiatric issues, communicable diseases, NFR orders, social and family issues, by first meeting in a designated work area and not at the patient's bedside (Queensland Health, 2013).

The findings from the service user focus group study commissioned by the GDG identified a recurring theme regarding clinical handover reports which was that many participants spoke about a lack of information about themselves and 'being kept out of the loop'. A sense of being uninformed also extended to their partners in instances where their care was escalated and their partners were not kept informed. Participants appeared uncomfortable with 'large teams at the bedside discussing their care and history'. They also expressed a preference for 'frequent updates quietly at the bedside' or 'in a small private room where sensitive matters were being communicated and discussed'.

2.4 Clinical handover content

2.4.1 Shift clinical handover - structured format/common language

The following are responsible for implementation of recommendation 25

CEO/General Manager/Hospital Manager and Clinical Director/Director of Nursing and/or Midwifery of the healthcare organisation.

Recommendation 25:
Shift clinical handover should be conducted using the $ISBAR_3$ communication tool (Identify, Situation, Background, Assessment, Recommendation, Read-back, Risk) as a structured framework which outlines the information to be transferred. The tool may be available in written format and preferably electronically.
Level of Evidence: 2- and 4
Grade of recommendation: D
References: South Australia Department of Health (2010) *Clinical Handover Guidelines:* Government of South Australia: Adelaide SA.

Practical Guidance
$ISBAR_3$ tool sample (see Appendix 9), should be included in education and training programmes. $ISBAR_3$ for Shift Handover is a new communication tool developed by the GDG adapted from ISBAR.

ISBAR$_3$ Communication (clinical handover) Tool SAMPLE Shift Handover	
I Identify	**Identify:** Lead handover person Individuals/Team receiving handover Patient(s)
S Situation	**Situation:** Location of patient(s) Brief summary of current status Is there a problem?
B Background	**Background:** Concise summary of reason for admission Summary of treatment to date Baseline observations (current admission) Vital Signs: BP, Pulse, Resps, S_PO_2, (F_iO_2), Temp, AVPU. IMEWS (include previous IMEWS if appropriate) NEWS (include previous NEWS if appropriate)
A Assessment	**Assessment:** What is your clinical assessment of the patient at present?
R$_3$ Recommendation Read-Back Risk	**Recommendation:** Specify your recommendations Read-Back: Recipients to confirm handover information Risk: Include the safety pause to identify possible risks

Adapted by GDG with permission from Dr S. Marshall, Monash University, Australia.

Rationale

Health professionals, particularly junior staff (Apker et al. 2007; McFetridge *et al.* 2007), may find it difficult to discern the relevant information to hand over in a given scenario (McFetridge *et al.* 2007; Philibert *et al*. 2009). The literature suggests that clinicians may rely on professional judgement concerning the information items to pass on (Wilson *et al.* 2005), that more experienced staff may be better able to prioritise information (McFetridge *et al.* 2007) and may deliver a more effective clinical handover as a result (Poot *et al.* 2013). The information transferred at clinical handover can often be highly variable (Thakore and Morrison, 2001; Carter *et al.* 2009; Evans *et al.* 2010; Bump *et al.* 2011; Health Foundation, 2011; Maughan *et al.* 2011; Ilan *et al.* 2012; Poot *et al.* 2013) or irrelevant for patient care (Jenkin *et al.* 2007). As such, professionals may benefit from guidance in relation to the key information to be transferred at handover, either captured by a checklist or structured form, or prompted through the use of a mnemonic. Defining the content to be handed over may also mitigate the risk of 'diagnosis momentum', whereby the clinician overestimates the information and knowledge already possessed by the receiving professional (Beach *et al*. 2012; Riesenberg, 2012), by creating shared expectations and predictability around the information to be communicated (Leonard *et al.* 2004).

Using a checklist or structured written template can improve the completeness of information transferred during shift change (Lee *et al.* 1996; Berkenstadt *et al.* 2008; Weiss *et al.* 2013) and the follow-up of tasks (Stahl *et al.* 2009). Nursing staff have suggested that a shift report with a structured layout or encompassing a checklist, with space for notes, would improve the quality of clinical handover (Welsh *et al.* 2010).

Depending on the purpose, clinical handover should include information regarding unstable patients and anticipatory guidance indicating potential clinical risks to the patient that may arise (Department of Health (South Australia), 2013a), and should also specify the person allocated with responsibility for the patient, who can be contacted if needed (Royal College of Surgeons

of England, 2007; Department of Health (South Australia), 2013a). Physicians have suggested that staff need to be provided with enough information at shift clinical handover in order to understand the rationale behind the tasks communicated in order to enable them to prioritise care effectively (Health Foundation, 2011). Failure to provide clear anticipatory guidance at shift clinical handover has been reported to cause problems on subsequent shifts (Horwitz *et al*. 2009b). The items staff felt were most important to be included in a shift clinical handover sheet were task lists, relevant, accurate and up-to-date information, and any changes which had occurred in the previous 24 hours (Wayne *et al.* 2008).

The SA Department of Health (2013a) recommends that a structured communication tool, ISBAR, should be used for clinical handover and customised, as appropriate, to the specialty or situation. ISBAR has been associated with improved transfer of information and overall clarity and organisation of communication (Marshall *et al*. 2009). The ISBAR communication tool is already in use for communication in relation to patient deterioration in a number of disciplines in the Irish healthcare system.

The Joint Commission and the WHO both recommend the use of 'read back' to ensure a common understanding of expectations (Brown, 2004; Joint Commission, 2006; World Health Organisation, 2009). Read-back has also been identified by Perry *et al* (2008) and Spooner *et al* (2013) as good practice. Randell *et al.* (2011) reported the benefits of a two-way communication process at clinical handover across three UK sites, observing that asking questions allowed information to be corrected and verified and errors identified. The findings of the non-participant observation of clinical handover study commissioned by the GDG identified that read-back occurred in 9 out of 10 clinical handovers. Workforce diversity is important to respect in the adoption of effective clinical clinical handover models and processes, that is, acknowledging that English may not be the first language of some staff members (Australian Healthcare and Hospitals Association, 2009).

The findings from the literature search and review and fieldwork commissioned by the GDG (Appendix 6) also identified clinical handover as a risk (Sharit *et al.* 2008). The GDG recommended the inclusion of the Safety Pause (HSE 2013), (Appendix 10) as part of addressing risks in the communication (handover) tool for shift clinical handover.

It is the consensus of the GDG to recommend the $ISBAR_3$ communication tool for inter-departmental clinical handover. R_3 includes Read-back and Risk in addition to Recommendations.

2.4.2 Inter-departmental clinical handover - structured format

The following are responsible for implementation of recommendation 26:
CEO/General Manager/Hospital Manager and Clinical Director of the healthcare organisation

Recommendation 26: Inter-departmental clinical handover should be conducted using the $ISBAR_3$ communication tool as a structured framework which outlines the information to be transferred. The tool may be available in written format, but preferably electronically.
Level of Evidence: 2-
Grade of recommendation: D

Practical Guidance
Examples of inter-departmental clinical handover are:
- Maternity ward/unit to maternity ward/unit
- Maternity ward/unit to HDU/ICU
- Maternity ward/unit to operating theatre
- Maternity ward/unit to SCBU/NICU/paediatrics

$ISBAR_3$ tool sample below, also available in (Appendix 9), should be included in education and training. Patients should not be transferred from department to department, if possible, except where there is a clinical need, reducing the need for clinical handover and enhancing the patient experience.

$ISBAR_3$ for Inter-departmental handover is a new communication tool developed by the GDG adapted from ISBAR.

$ISBAR_3$ Communication (clinical handover) Tool SAMPLE Inter-departmental Handover	
I Identify	**Identify:** You Recipient of handover information Patient
S Situation	**Situation:** Location of patient as appropriate Brief summary of patient's current status Is there a problem?
B Background	**Background:** Concise summary of reason for interdepartmental handover Summary of treatment to date Baseline observations (current admission) Vital Signs: BP, Pulse, Resps, S_PO_2, (F_iO_2), Temp, AVPU. IMEWS (include previous IMEWS if appropriate) NEWS (include previous NEWS if appropriate)
A Assessment	**Assessment:** What is your clinical assessment of the patient at present?
R_3 Recommendation Read-Back Risk	**Recommendation:** Specify your recommendations Read-Back: Recipient(s) to confirm handover information and responsibility Risk: Include the safety pause to identify possible risks

Adapted by GDG with permission from Dr S. Marshall, Monash University, Australia.

Rationale
Differing perceptions between specialities in terms of what information is required at clinical handover have been reported as an issue in the context of acute medicine, during ED to ICU (McFetridge *et al.* 2007), ED to internal medicine (Apker *et al.* 2007) and paramedic to ED (Owen *et al.* 2009) clinical handovers. There may be a wide range of opinions between professional groups in terms of what information is believed to be essential to hand over (Siddiqui *et al.* 2012). Using a checklist or structured template during inter-departmental clinical handover has been associated with improvements in the completeness of data transfer (Zavalkoff *et al.* 2011; Karakaya *et al.* 2013; Salzwedel *et al.* 2013) and reductions in omissions and technical errors (Coutsouvelis *et al.* 2010; Joy *et al.* 2011; Craig *et al.* 2012a). However, using a written checklist to guide inter-departmental clinical handover has also been shown to increase the duration of the event (Salzwedel *et al.* 2013). ISBAR has been associated with improved transfer of information and overall clarity and organisation of communication (Marshall *et al*. 2009).

The Joint Commission and the WHO both recommend the use of 'read back' to ensure a common understanding of expectations (Brown, 2004; Joint Commission, 2006; World Health Organisation, 2009). Read-back has also been identified by Spooner *et al.* (2013) and Perry *et al* (2008) as good practice. Workforce diversity is important to respect in the adoption of effective clinical handover models and processes, that is, acknowledging that English may not be the first language of some staff members (Australian Healthcare and Hospitals Association, 2009)

The findings from the literature search and review and fieldwork commissioned by the GDG (Appendix 6) also identified clinical handover as a risk (Sharit *et al* 2008). The GDG recommended the inclusion of the Safety Pause (HSE 2013, Appendix 10) as part of addressing risks in the communication (handover) tool for shift clinical handover.

It is the consensus of the GDG to recommend the $ISBAR_3$ communication tool for inter-departmental clinical handover. R_3 includes Read-back and Risk in addition to Recommendations.

2.4.3 Electronic clinical handover applications/templates

The following are responsible for implementation of recommendation 27:
CEO/General Manager/Hospital Manager of the healthcare organisation

Recommendation 27: Where electronic clinical handover applications and templates are in use or being developed, they should incorporate the $ISBAR_3$ communication tool.
Level of Evidence: 2-
Grade of recommendation: D

Practical Guidance
Electronic applications and templates should be developed in consultation with healthcare staff.

Rationale
Reported issues with using electronic tools to support clinical handover include access permissions (Govier *et al*. 2012), limited portability options (Staggers *et al.* 2011), failure to populate with up-to-date information (Rabinovitch *et al.* 2009; Staggers et al. 2011; Wilson *et al.* 2005; Govier *et al.* 2012), limited flexibility around sorting and arranging the information (Rabinovitch *et al.* 2009) and limited flexibility around adding notes (Staggers *et al.* 2011). If staff believe their original process to be adequate they may not adopt these tools (Little *et al*. 2009). For electronic tools to work successfully, well described workflows with standardised procedures and protocols need to be in place, along with an effective IT system, including the possibility of mobile stations, which can be transported to the bedside to increase access (Hertzum and Simonsen, 2008). Furthermore,

these tools need to be developed through a participatory process with users and aim to support, not replace, good clinical handover practice, including face-to-face communications and discussion between professionals (Thomas *et al.* 2009).

2.4.4 Communication of patient deterioration

The following are responsible for implementation of recommendation 28:
CEO/General Manager/Hospital Manager and Clinical Director of the healthcare organisation

Recommendation 28: The ISBAR communication tool should be used when communicating information in relation to deteriorating and/or critically ill patients.
Where a situation is deemed to be critical, this must be clearly stated at the outset of the conversation.

Level of Evidence: 1+ (Marshall *et al*. 2009), 2- (Remaining studies)
Grade of recommendation: B
References: South Australia Department of Health, 2013a
National Clinical Guideline No.1 The National Early Warning Score (DoH, 2013)
Guidelines for the Critically Ill Woman in Obstetrics (HSE, 2014).
See Care Pathway for the Deteriorated Critically Ill Pregnant Woman, (further information in Appendix 13).
Levels of Critical Care, in National Standards for Adult Critical Care Services, Joint Faculty of Intensive Care Medicine of Ireland, RCSI *(2011*) Available at:
https://www.anaesthesia.ie/attachments/article/57/JFICMI_Minimum_Standard s%20 Rev-01.pdf
National Clinical Guideline No.4 Irish Maternity Early Warning System (IMEWS)
National Clinical Guideline No.6 Sepsis Management
Available at www.health.gov.ie/patient-safety/ncec

Practical Guidance
The GDG recognise the time critical element of communication in relation to patient deterioration. However, using the ISBAR communication tool does not prohibit parties from seeking clarification to enhance understanding of the critical nature of patient deterioration, and may be sought at any point during the communication process if required.

Communication in relation to the deteriorating patient using the ISBAR communication tool does not include clinical handover of responsibility.

The GDG recognise the importance of a response to communication on deteriorating and/or critically ill patients, however the scope of this guideline does not include the response/care intervention e.g. resuscitation and care escalation such as transfer to ICU. It is important to recognise that the deteriorating patient may be critically ill requiring Level 2 Care or Level 3 Care, further details in Appendix 11 (Levels of Critical Care, *National Standards for Adult Critical Care Services 2011*, Joint Faculty of Intensive Care Medicine of Ireland).

The *Care Pathway for the Deteriorated Critically ill Pregnant Woman* (Appendix 11) as outlined in the *Guidelines for the Critically ill Woman in Obstetrics* (HSE 2014) and the Irish Maternity Early Warning System (IMEWS), National Clinical Guideline No. 4 (DoH, 2014) should be adhered to.

See ISBAR tool sample, also available in (Appendix 9)

ISBAR Communication Tool SAMPLE Patient Deterioration	
I **Identify**	**Identify:** You Recipient of handover information Patient
S **Situation**	**Situation:** Why are you calling? (Identify your concerns)
B **Background**	**Background:** What is the relevant background?
A **Assessment**	**Assessment:** What do you think is the problem?
R **Recommendation**	**Recommendation:** What do you want them to do?

Reproduced and adopted with permission from Dr S. Marshall, Monash University, Australia.

Rationale

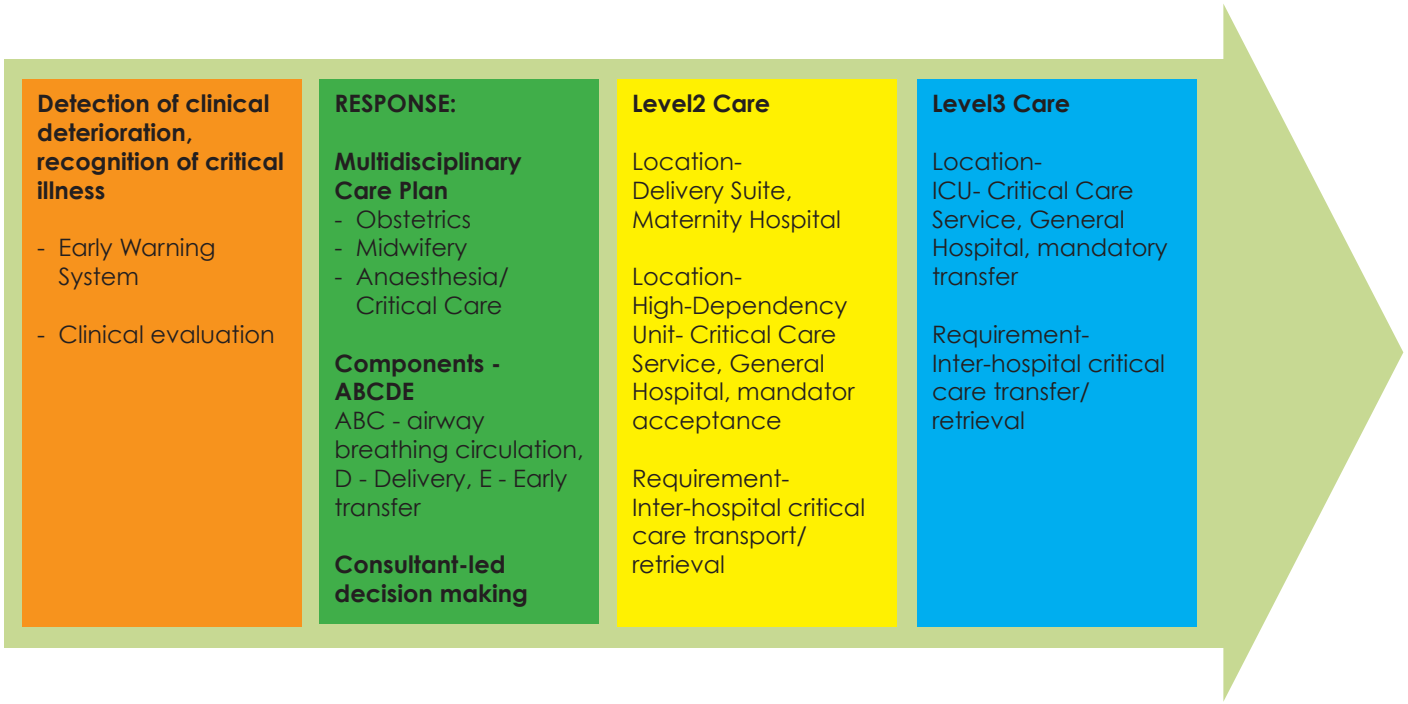
The Centre for Maternal Child Enquiries (CMACE) (2011) identified major failures in communication as contributing to suboptimal care leading to maternal death, and noted that healthcare workers need to 'communicate the gravity and urgency' of the situation when escalating care of the deteriorating pregnant woman.

The SA Department of Health (2013a) recommends that a structured communication tool, ISBAR, should be used for clinical handover and customised, as appropriate, to the specialty or situation. When used by nursing staff to communicate about deteriorating patients, SBAR has been associated with a decrease in unexpected deaths and increased transfers to ICU (De Meester *et al.* 2013). When interns were trained in ABC-SBAR to hand over de-compensating paediatric patients they took less time to communicate essential content (McCrory *et al.* 2012). When used for telephone referrals where advice was sought during a simulated scenario involving the management of an unstable patient, ISBAR has been associated with improved transfer of information and overall clarity and organisation of communication (Marshall *et al*. 2009). Authors suggest that SBAR or ISBAR may be more suitable for one-way communications (Cohen and Hilligoss, 2010; Eggins and Slade, 2012), for example, in rapid-response scenarios (Pillow *et al.* 2007).

This guideline should be read in conjunction with:

- Guidelines for the Critically Ill Woman in Obstetrics (HSE, 2014), developed by the Clinical Strategy and Programmes Division, HSE. The document in question includes a standard for safe transfer to critical care from a maternity unit and guidelines on communication, which recommend the use of the ISBAR communication tool to optimise communication of critical information.
- Irish Maternity Early Warning System (IMEWS), National Clinical Guideline No. 4 (DoH, 2014).
- National Early Warning Score (NEWS), National Clinical Guideline No. 1 (DoH, 2013).

Care pathway for the deteriorated critically ill pregnant woman



2.5 Additional recommendations

2.5.1 Education and training

The following are responsible for implementation of recommendation 29:
Higher Education Institutions (HEIs), Professional Regulatory Bodies

Recommendation 29:
Higher Education Institutions (HEIs) with responsibility to provide preparatory professional education, continuing education and professional development for all healthcare professionals should incorporate communication (clinical handover) practice within curricula.
Level of Evidence: Existing guidance
Grade of recommendation: D
References: Department of Health (South Australia), 2013a [3];

Rationale
The findings from the focus group discussions and interviews commissioned by the GDG identified a deficit of formal education on communication (clinical handover). Several participants stated that the ISBAR communication tool is valuable for teaching midwifery students.

2.5.2 Guideline implementation

The following are responsible for implementation of recommendation 30:
Health Service Executive

Recommendation 30:
A communication (clinical handover) group should be established at national level to support national implementation of this guideline.
Level of Evidence: 4
Grade of recommendation: D

Practical Guidance
The role of the group in providing support which includes the development of Terms of Reference should be defined by the HSE.
The Terms of Reference should include:

- Education on communication (clinical handover) through various methods such as web, use of an App, road shows etc.
- Access to the guideline, the ISBAR and $ISBAR_3$ templates
- Evaluation and audit to ensure implementation and measure impact of the guideline to support continuous quality improvement.

Rationale
GDG consensus

3 References and appendices

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Appendices

Appendix 1: Guideline Development Group - terms of reference, membership, conflicts of interest and contribution of members to National Clinical Guideline

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1.1 Context

The only conceivably worthy honour due to those harmed is to make changes that will save other people and other places from similar harm (Berwick 2013).

The Communication (handover) Sub-group/Guideline Development Group is a sub-group of the National Implementation Group – HSE/HIQA Maternity Services Investigations.

The HSE undertook to provide a report on the events which took place between the 21st of October and the 28th of October, 2012 in Galway University Hospital (GUH), relating to the tragic maternal death of Savita Halappanavar, and to establish if any aspect of the care that Savita received may have contributed to her death and if so, to identify the key causal and contributory factors, considered by the investigation team to have had an effect on the eventual adverse outcome. The HSE also set out to make any necessary local and national recommendations to address identified contributory factors or causes so as to prevent future harm arising from these causes and to improve the safety of services for future service users. The investigation team made nine recommendations to address the factors that were identified as contributing to the key causal factors. Recommendation 5 relates to communication.

The HSE established a National Implementation Group – HSE/HIQA Maternity Services Investigations in March 2013 to co-ordinate and oversee the implementation of any recommendations made by the investigation team. National Implementation Group – HSE/HIQA Maternity Services Investigations commissioned five Sub-groups to support them in their role, including this group, the Communication (handover) Sub-group/Guideline Development Group.

The Communication (handover) Sub-group/Guideline Development Group will make recommendations to the National Implementation Group – HSE/HIQA Maternity Services Investigations addressing *Recommendation number 5* of the HSE Report, (June 2013), *Recommendations 4 & 7* of the Coroner's Report (April 2013), *National Recommendation number* 9 of the Health Information and Quality Authority (HIQA) Report (October 2013).

Factors that may affect timeframes for communication and handover will also be considered such as:

- The European Working Time Directive (EWTD);
- Economic downturn;
- Staff shortages due to retirement, leave and emigration;
- The moratorium on recruitment.

This is not an exhaustive list and other factors may be included for discussion/consideration from time to time as necessary.

This body of work will also inform the work of other work streams of the National Implementation Group – HSE/HIQA Maternity Services Investigations and the National Maternity Review.

HSE Report, June 2013- Recommendation number 5:
The HSE should implement and audit compliance with improved communication practices between all disciplines and grades of staff, and implement improvements in the handover for acutely ill patients including between staff shifts. Adoption of appropriate definitive communication tools to assist clear and focussed communication of information in relation to the deterioration of a woman's condition, and/or consultation, and/or handover to a higher level of care, such as ISBAR (HSE National Acute Medicine Programme (NAMP), 2010) which is a modification of SBAR as recommended within 'Improving patient handover – Royal College of Obstetricians & Gynaecologists (RECOG) Good Practice No 12' (Dec 2010) is recommended.

Coroner's Report, April 2013- Recommendation 4
Proper and effective communication to occur between staff on-call and a team coming on duty and a dedicated handover time is set aside for such communications. That should be applied nationally.

Recommendation 7
Early and effective communications with patients and/or their relatives to ensure that a treatment plan is readily explained and understood. And this should be applied nationally.

HIQA Report, 2013-National Recommendation 9
The HSE should develop, and ensure the implementation of a national guideline for the effective communication and clinical handover of information relating to the care of a patient both within and between clinical teams. This should be based on best available evidence and provide for effective handover in any clinical situation. Additional guidance should be provided to tailor this for the clinical handover of patients for different clinical settings with maternity services being the first setting to be prioritised.

In healthcare, effective communication involves arriving at a shared understanding of a situation and in some instances a shared course of action. This requires a wide range of generic communication skills, from negotiation and listening, to goal setting and assertiveness, and being able to apply these generic skills in a variety of contexts and situations (Victorian Government DOH 2010; Murphy *et al*. 1997).

Without effective communication, competent individuals form an incompetent team (Lingard 2012).

1.2 Vision: Improved patient outcomes

- The development of patient centred, evidence based communication tools and a National Guideline, that when implemented and utilised nationally, will assist clear and focused communication of information relating to the patient's condition, both urgent and routine, to include the following:
  - Professional consultations such as:
    - Team to team;
    - One profession to another;
    - Laboratory to team;
    - Radiology to team;
  - Deterioration in a patient's condition;
  - Transitions of care such as:
    - handover of patient care at a change of shift;
    - handover to a higher level of care (e.g. Ambulance staff to ED/AMAU staff, Model 2/3 hospital to Model 4 hospital, Ward to ICU/CCU);
    - communication with patients and/or their relatives, to ensure that a treatment plan is readily explained and understood.
    - communication on discharge of a patient with:
      - Patients and their families/carers.

2.1 Terms of Reference and Membership of the National Implementation Group – HSE/ HIQA Maternity Services Investigations are available on request.

2.2 Role of the Communication (Handover) Sub-group/Guideline Development Group

The role of the Communication (handover) Sub-group/Guideline Development group is to address the communication and handover recommendations of the HSE, Coroner's and HIQA Reports and make recommendations to the National Group by end 2014.

Phase 1: The Communication (handover) Sub-group/Guideline Development Group will:

1. Develop a project plan with defined timelines.

2. Define the scope of the project.

3. Explore the use of electronic systems in healthcare communication and make recommendations to the National Group re: IT and alert solutions, identifying interim solutions.

4. Make recommendations on the implementation of an evidence based communication tool and a National Guideline, that when implemented and utilised nationally, will assist clear and focused communication of information relating to the patient's condition, both urgent and routine to include the following:
   - Professional consultations such as:
     - Team to team;
     - One profession to another;
     - Laboratory to team;
     - Radiology to team.
   - Deterioration in a patient's condition in maternity services.
   - Transitions of care such as:
     - Handover of patient care at a change of shift;
     - Handover of patient care including to a higher level of care (e.g. Ambulance staff to ED/AMAU staff, Model 2/3 hospital to Model 4 hospital, Ward to ICU/CCU);
     - Communication with patients and/or their relatives, to ensure that a treatment plan is readily explained and understood;
     - Communication on discharge of a patient.

5. Develop a Guideline to assist healthcare staff' and service users' decision making about the process of communication and handover between healthcare staff and patients/relatives.

6. Liaise with clinical staff representing different grades of seniority and settings to include midwives, nurses and doctors etc, at different stages of the project as appropriate from:
   - Stand-alone maternity units;
   - Large co-located units;
   - Small co-located units;

7. Provide regular progress reports to the National Implementation Group – HSE/HIQA Maternity Services Investigations and provide a final report to include the sub-group's recommendations by end 2014.

8. Develop, agree and recommend audit tools, for healthcare staff, to reflect the recommendations of this group.

2.3 Project Plan and timelines

A detailed project plan will be prepared by the Communication (handover) Sub-group/Guideline Development Group and approved by the National Implementation Group – HSE/HIQA Maternity Services Investigations.

The Communication (handover) Subgroup/Guideline Development Group will report by the end of 2014, with routine monthly reports to be provided.

2.4 International review

The group will consult with international experts to review the proposed recommendations and materials, Communication (handover) Sub-group/Guideline Development Group.

2.5 Patient and public involvement

The advice of patients and members of the public will be sought throughout the project. This will be facilitated through the Patient Advocacy Unit, HSE and patient representation on the group.

2.6 Governance

The Communication (handover) Sub-group/Guideline Development Group will report to the Chair of the National Implementation Group – HSE/HIQA Maternity Services Investigations.
The Communication (handover) Sub-group/Guideline Development Group is responsible for making recommendations to the National Implementation Group – HSE/HIQA Maternity Services Investigations addressing the communication and handover recommendations of the HSE, Coroner and HIQA Reports.

3.1 Membership the Communication (Handover) Sub-group/Guideline Development Group

Membership nominations were sought from a wide variety of sources so as to be as representative of all key stakeholders within the healthcare arena. The sub-group may, from time to time, co-op expertise from relevant sources as required.

Nominee	Position
Ms. Eilish Croke	Chair
Ms. Celine Conroy	Project Manager
Dr. Ulrich Bartels	Consultant Obstetrician/Gynaecologist, Mayo General Hospital
Ms. Emma Benton	Therapy Professions Advisor & Portfolio Manager (Diagnostic/Support Services), Clinical Strategy & Programmes
Ms. Anne Bergin	Research Officer
Ms. June Boulger	Patient Advocacy Unit, Quality and Patient Safety Division, HSE
Dr. Ciaran Browne	National Lead for Acute and Palliative Care Services
Ms. Bernie Connolly	Professional Advisor, Midwifery, NMBI
Prof. Garry Courtney	Clinical Lead, National Acute Medicine Programme (to consult with as required)
Ms. Carmel Cullen	HSE Communications
Prof. Gerard Fealy	Associate Dean for Research and Innovation UCD and Communication (handover) project Methodologist.
Dr John Fitzsimons	Paediatric Consultant, Quality and Patient Safety Division, HSE
Ms. Mary Flynn	HSE Midwifery
Ms. Maureen Flynn	National Lead Quality and Safety Governance Development, Quality and Patient Safety Division, HSE
Mr. Paul Gallen	Ambulance Service
Ms. Mary Godfrey	Clinical Risk Advisor, State Claims Agency
Dr. Miriam Griffin	Consultant Histopathologist and Cytopathologist - Clinical Director & Project Manager, National MedLIS Project (to consult with as required)
Dr. Mark Hehir	JOGS, SpR Obstetrics and Gynaecology, Coombe Women & Infants University Hospital.
Dr. Colm Henry	National Lead Clinical Director Programme (to consult with as required) Quality and Patient Safety Division, HSE
Mr. Louis Lavelle	AMP Programme Coordinator, Quality and Patient Safety Division, HSE
Dr. Ciara Martin	Emergency Medicine Programme, Consultant in paediatric emergency medicine
Dr. John Murphy	Neonnatology, National Clinical Lead, Neonatology
Ms. Margaret Philbin	IADNAM, DOM, Rotunda Hospital
Dr. Michael Power	National Clinical Lead, Critical Care Programme (to consult with as required)
Ms. Melissa Redmond	Patients for Patient Safety Champions Network, Quality and Patient Safety Division, HSE
Dr. Anthony Ryan	Faculty of Radiology
Dr. Terry Tan	Consultant Anaesthetist, Coombe Hospital
Ms. Angela Tysall	Open Disclosure, Project Manager National Advocacy Unit, Quality and Patient Safety Division, HSE

4.1 Communication (handover) Sub-group/Guideline Development Group process for meetings.

This section outlines how the Communication (handover) Sub-group/Guideline Development group will make decisions.

4.1.1 Attendance

The project manager will maintain a record of attendance, apologies and non responders. Teleconference facilities will be provided for each meeting.

4.1.2 Apologies

Apologies should be sent to the project manager in advance of the meeting.

4.1.3 Frequency of meetings

A schedule of meetings will be agreed by the Communication (handover) Sub-group/Guideline Development Group. The Sub-group will meet monthly initially

4.1.4 Venue

The venue for each meeting, in as far as possible, will be 200 Parnell Street, Dublin (room will be arranged by the NAMP co-ordinator) or if unavailable, an alternative suitable venue will be sourced and advised to the members accordingly.

4.1.5 Meeting documentation

The project manager will forward relevant documentation to the group at least three working days in advance of the meeting, including:

- Meeting notes of previous meeting
- Agenda
- Other relevant supporting documentation

4.1.6 Decision making

The agenda will identify items that require decisions to be made at the meeting. Where group members are unable to attend, in person or by teleconference, they may submit comments to the project manager, by email, by 5pm on the day prior to the meeting. The project manager/ chairperson will bring forward all comments received for consideration by the group in attendance. Decisions will be made by those attending the meeting and brought to the subsequent National Implementation Group – HSE/HIQA Maternity Services Investigations for sign off. The meeting notes will detail such decisions to members who were not in attendance.

4.1.7 Administrative support

The project manager will coordinate meetings and note taking etc. Materials will be prepared by the project manager and sent to group members three working days in advance of the meetings.

5.1 References

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Appendix 2: Systematic search and literature review

Communication and Clinical Handover Practices: A Systematic Review

Gerard Fealy and Fiona Riordan

A Systematic Review of Literature conducted on behalf of the Health Service Executive National Communication (clinical handover) sub-group/Guideline Development Group

July 2014

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List of abbreviations

ACOG	American College of Obstetricians and Gynecologists
ACSQHC	Australian Commission for Safety and Quality in Healthcare
AE	Adverse Events
AHHA	Australian Healthcare and Hospitals Association
AHRQ	Agency for Healthcare Research and Quality
AIR	Australian Institute of Radiography
AMA	Australian Medical Association
AMB	Australian Medical Board
AORN	Association of Perioperative Nurses
ARCHI	Australian Resource Centre for Healthcare Innovations
BMA	British Medical Association
CCHMC	Cincinnati Children's Hospital Medical Center
CEC	Clinical Excellence Commission
CPICU	Cardiac Paediatric Intensive Care Unit
CPSQA	Commission on Patient Safety and Quality Assurance
ED	Emergency Department
EHR	Electronic Health Record
EM	Emergency Medicine
EMP	Emergency Medicine Programme
EMR	Electronic Medical Record
EPR	Electronic Patient Records
EWTD	European Working Time Directive
FIGO	International Federation of Gynecology and Obstetrics
FMEA	Failure Mode Effects Analysis
GMC	General Medical Council
HEAR	Handoff Evaluation Assessing Receivers
HELiCS	Handover: Enabling Learning in Communication (for) Safety
HIQA	Health information and Quality Authority
HRE	High-Risk Events
HSCPC	Health and Social Care Professionals Council
HSE	Health Service Executive
ICU	Intensive Care Unit
IM	Internal Medicine
I-MEWS	Irish Maternity Early Warning System
LMC	Lead Maternity Carer
LOS	Length of stay
MET	Medical Emergency Team
MICU	Medical Intensive Care Unit
MOH	Maternal Obstetric Haemorrhage
NCEC	National Clinical Effectiveness Committee
NCHD	Non Consultant Hospital Doctor
NFR	Not for Resuscitation

NHMRC	National Health and Medical Research Council
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NMBI	Nursing and Midwifery Board of Ireland
NMC	Nursing and Midwifery Council
NPSA	National Patient Safety Agency
NSW Health	NSW Department of Health
OR	Operating Room
PACU	Post Anaesthesia Care Unit
PICU	Paediatric Intensive Care Unit
RANZCOG	Royal Australian and New Zealand College of Obstetricians and Gynecologists
RCN	Royal College of Nursing
RCoA	Royal College of Anaesthetists
RCOG	Royal College of Obstetricians and Gynecologists
RCP	Royal College of Physicians
RCSE	Royal Colleges of Surgeons of England
RCT	Randomised Controlled Trial
SA Health	Department of Health (South Australia)
SAQ	Safety Attitudes Questionnaire
SIGN	Scottish Intercollegiate Guidelines Network
SMITH	Structured Multidisciplinary Intershift Handover
TCAB	Transforming Care at Bedside
UCD	University College Dublin
VQC	Victorian Quality Council
WA Health	Department of Health (Western Australia)
WHO	World Health Organisation

1. Introduction and background

Effective communication is considered central to the delivery of safe and reliable patient care (World Health Organisation, 2009). In particular, the point at which a patient's care is handed over from one healthcare professional, or clinical team, to another, carries inherent risks, presenting unique challenges in terms of maintaining continuity of care (Arora *et al.* 2005, Arora and Johnson, 2006, Sharit 2008, Manser 2011). The introduction of the European Working Time Directive (EWTD) (Council directive 93/102/EC, 1993), has led to fundamental changes in staff working patterns. More frequent staff turnover, combined with workforce constraints, has meant that patients encounter an increasing number of handovers during a single period of care (Arora *et al.* 2005, Arora and Johnson, 2006, Sharit *et al.* 2008). Therefore, it is vital to implement evidence-based methods of conducting handover communications, which contribute to seamless and reliable information transfer, in order to mitigate the challenges of this process and ensure the safety of patients.

A number of national reports have highlighted how poor communication processes may contribute to adverse patient events within maternity services (Health Service Executive, 2008, Health Information and Quality Authority, 2013, Health Service Executive, 2013, Department of Health, 2014). Two reports into the maternal death of Savita Halappanavar (Incident 50278) at University College Galway (UHG) (Health Information and Quality Authority, 2013, Health Service Executive, 2013), and the recent review of the peri-natal deaths at Portlaoise Hospital (Department of Health, 2014) have called attention to the lack of clear and formal guidance on the handover/communication of patient information and, specifically, the absence of protocols with respect to verbal and written handover of patients at duty shift change, during intra-hospital transfer and when patients are escalated to a higher level of care.

In light of the findings relating to Incident 50278, the Health Service Executive (HSE) made several recommendations. These included the need to: establish standard communication practices between staff; improve practices of handover and communication relating to the care of acutely ill patients; adopt suitable communication tools, which would allow for clear and effective communication of clinical information; and develop a National Maternity Services Strategy, which would provide guidance, supported by the best available evidence, on how communication and clinical handover can most effectively be conducted, both between and within clinical teams (Health Information and Quality Authority, 2013, Health Service Executive, 2013).

The HSE established a National Implementation Support Group in March 2013 to coordinate and oversee the implementation of the recommendations arising from the reports, and further commissioned three Sub-groups to support them in their role, including the Communication Sub-Group/Guideline Development Group, which was tasked with addressing the recommendation relating to communication and handover. The Sub-Group commissioned the UCD School of Nursing, Midwifery and Health Systems to conduct research into aspects of communication practices within maternity services in Ireland, with a particular focus on handover reports. This systematic review of literature on communication and handover practices forms part of that research.

2. Objectives

The overall aim of this review was to critically evaluate the published evidence on inter- and intra-professional communication and clinical handover within secondary and tertiary care services. While this guideline pertains to maternity services, it is relevant to all health services. The following are the objectives for this review:

1) Examine and report on the existing best-practice and guidelines in relation to communication and clinical handover, with a particular focus on standards for communication within maternity care services
2) Examine and report on the key barriers and enablers of good communication, including clinical handover
3) Examine and report on the effects of poor communication and handover processes on patient outcomes
4) Analyse and describe the range of communication and clinical handover tools and practices currently in use, evaluate their effectiveness based on the best available evidence, and make recommendations concerning their appropriateness for use in maternity care services in Ireland.

3. Methodology

The review was conducted into communication and handover practices in secondary and tertiary hospital services. The focus of the review was on both published and grey literature representing research, policy and practice relating to the communication, including communication tools in use for handover reports in maternity and other clinical care settings. The review was conducted according to rigorous methods for systematic integrative reviews and involved systematic searching, using explicit inclusion and exclusion criteria, data abstraction and synthesis.

3.1 Design

The design of the review was informed the National Clinical Effectiveness Committee (NCEC), Clinical Guidelines Development Manual 2013 (National Clinical Effectiveness Committee, 2013), which stipulates the use of PICO (Population, Intervention, Outcome) or PIPOH (Population, Intervention, Professional, Outcomes of interest, Healthcare setting) when framing the purpose of the review. The search terms using the PICOH elements are summarised in Table 1.

Table 1 Search terms summarised by PICOH elements

Population	medical personnel, health personnel, hospital staff, medical staff, medical professional, health professional, healthcare professional, healthcare provider, nurse, physician, resident, doctor, clinician
Intervention	inter-professional communication, intra-professional communication, inter-departmental communication, intra-departmental communication, interdisciplinary communication, multidisciplinary communication communication practice, communication standard, communication method, communication tool improving communication, communication improvement communication failure, communication breakdown, poor communication, inadequate communication, ineffective communication handover, handoff clinical handover, clinical handoff, patient handover, patient handoff , handover tool, handoff tool shift change, change-of-shift, end-of-shift, shift report, shift-to-shift, inter-shift, sign-out ISBAR, SBAR standardised communication, standardising communication, structured communication, structuring communication, communication standardisation
Comparison	(absence of communication standard, practice)
Outcome	Content measures: information items communicated , transferred Process outcomes: duration of communication, handover, interruptions during communication processes Staff outcomes: staff satisfaction, staff perception of safety and quality of communication Objective patient outcomes: length of stay (LOS), Adverse Events (AE), near misses, medical errors Subjective patient outcomes: staff perception of errors, staff perception of patient harm
Healthcare setting	general hospital, private hospital, teaching hospital, urban hospital, acute hospital, acute services, acute care facility, tertiary hospital, tertiary referral centre, tertiary care centre, tertiary care facility, secondary hospital, secondary care centre, secondary referral hospital, secondary referral centre, secondary care facility maternity hospital, maternity services, maternity unit, delivery unit, labour ward, delivery ward, delivery suite, obstetrics

3.2 Search strategy

The search strategy comprised multiple steps. A preliminary search was conducted of CINAHL and PubMed to determine the scope of the review and to generate a list of keywords. Following this, CINAHL, PubMed, EMBASE, Intute, psychINFO, the Cochrane Central Register of Controlled Trials and the Cochrane Database of Systematic Reviews, Joanna Briggs Institute, and Google Scholar were searched using combinations of the following keywords and their relevant MeSH terms: handover*, hand-over*, handoff*, hand-off*, clinical handover, patient handover, patient handoff, handover tool*, handoff tool*, communication tool*, communication failure*, poor communication, inadequate communication, ineffective communication, communication improvement*, communication standard*, communication practice*, communication method*, inter- and intra-departmental communication*, inter- and intra-professional communication*, inter- and intra-disciplinary communication*, multi-disciplinary communication*, shift report*, inter-shift, change-of-shift*, shift change, end-of-shift, standardised communication*, standardising communication*, structured communication*, communication standardisation. From this search it emerged that ISBAR, SBAR were the tools most commonly reported in the literature, therefore, a secondary search using these terms was conducted. All searches were limited to English-language literature published from 1990 through to 31 March 2014.

Only empirical studies were appraised as part of the review, thereby excluding publications that were non-research and anecdotal reports; however these publications provided contextual information to inform the review, as appropriate.

A grey literature search was also conducted using the following resources: OpenGrey, HSRProj, Virginia Henderson International Nursing Library-Registry of Nursing Research, Robert Wood Foundation, Lenus, The Kings Fund, World Health Organisation (WHO) and the Irish Nurses and Midwives Organisation. A list of regulatory and professional bodies which were searched for grey literature is included in Annex 1 (in the literature review section).

Reference lists of all included papers were reviewed for further publications not identified by the initial search strategy. Following the review of all sourced publications, a list of key author names was generated and used to conduct a further search of PubMed. The full PubMed search strategy is documented in the Annex 2 (in the literature section).

A search was also conducted to identify studies on the economic evaluation of handover tools, and improvement approaches to communication between health professionals. This economic search was conducted after the initial search. An economic filter, developed by the Scottish Intercollegiate Guidelines Network (SIGN), was added to the keyword searches outlined in the PICOH Table above. Searches were performed using Embase Classic+Embase 1947 to Present and MEDLINE(R) In-Process and Other Non-Indexed Citations and MEDLINE(R) 1946 to Present, the Database of Abstracts of Reviews of Effects, the NHS Economic Evaluation Database and the Health Technology Assessment Database and the Cochrane Central Register of Controlled Trials and the Cochrane Database of Systematic Reviews. Details of the MEDLINE economic search are also included in Annex 2 (in the literature section).

3.3 Inclusion and exclusion criteria

The focus of the review was communication and handover between health professionals working in secondary or tertiary care settings. Publications were included if they discussed any practice or tool used in the context of either inter or intra-professional communications or clinical handover in a hospital setting, for example, team to team or one profession to another. This included studies which: 1. Assessed existing handover and communication practices to determine barriers and enablers of handover or communication; 2. Evaluated the impact of poor handover or communication on patient and staff outcomes; 3. Evaluated the impact of implementing a specific handover or communication practice or tool, including technological and electronic

tools, on patient and staff outcomes; and 4. Delivered a training programme on a specific communication practice or tool and assessed the impact on handover quality in a simulated hospital environment.

Studies were excluded if they evaluated staff training programmes to improve teamwork, communication, or clinical handover skills, including handover training simulations, whereby the training program was the intervention under investigation, rather than the handover practice or tool being delivered as part of the program. Also excluded were studies concerned with communication tools and/or practices used during patient discharge from hospital to community or primary care, and studies conducted outside of the hospital setting, such as, in residential care homes, hospice care, rehabilitation centres and so forth. Publications which evaluated change management strategies to improve handover/communication (e.g. use of PDSA or action research), local audits of handover or communication practices, and studies which developed and validated tools to measure handover, communication, and teamwork processes among staff members, were excluded. Studies which broadly evaluated inter-professional collaboration and teamwork, as distinct from communication practices, were excluded, with the exception of studies which evaluated specific elements of team performance among maternity care teams. Studies were also excluded if they only used service user satisfaction as a means of evaluation. Publications which discussed patient-professional communication were also excluded from this review.

3.4 Search outcomes

The outcomes from the search strategy, using the PRISMA framework are presented in Figure 1a below. The outcomes from the search strategy for the economic search, also using the PRISMA framework is presented in Figure 1b.

Figure 1a Article search and selection process using the PRISMA framework

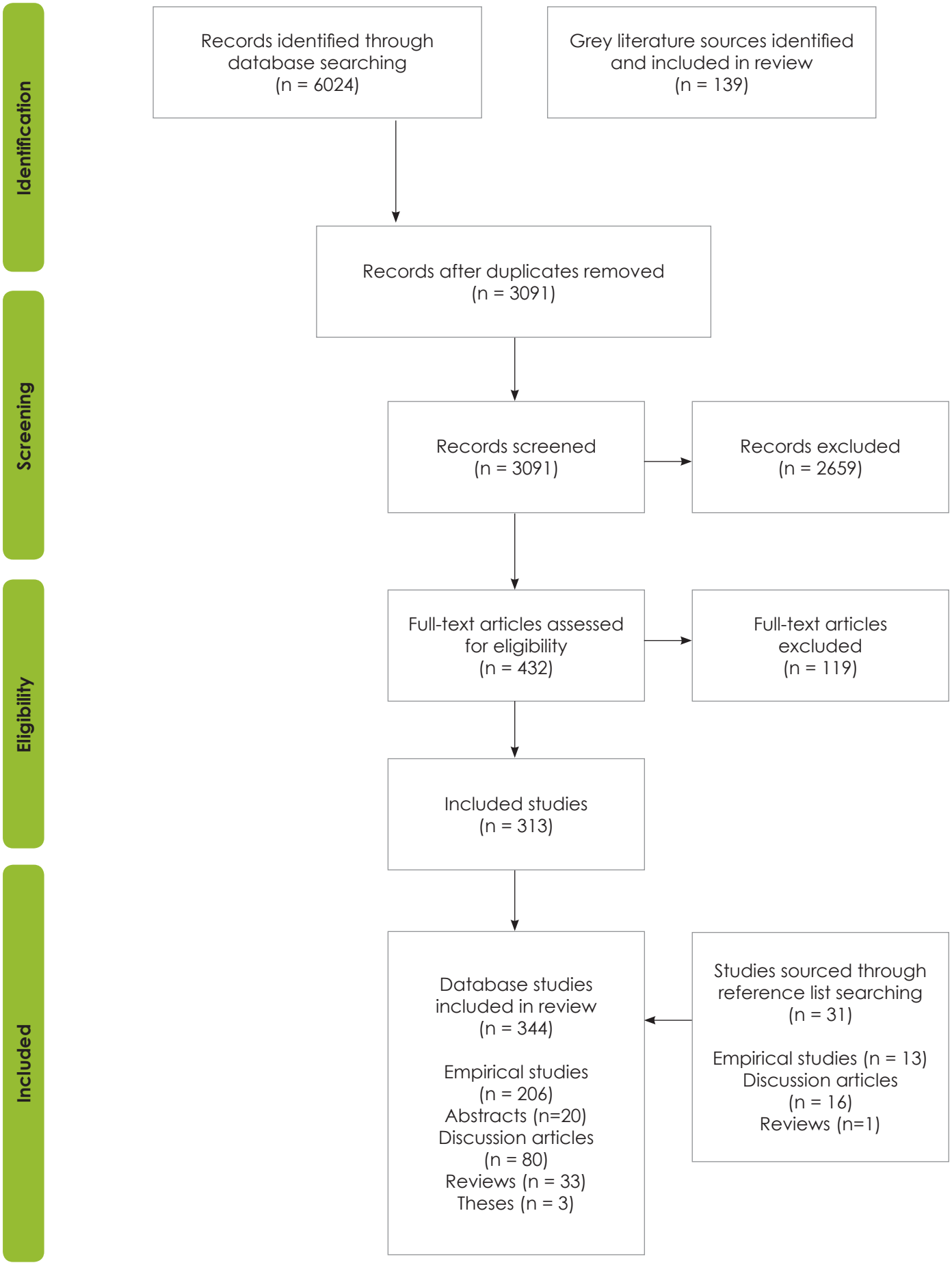
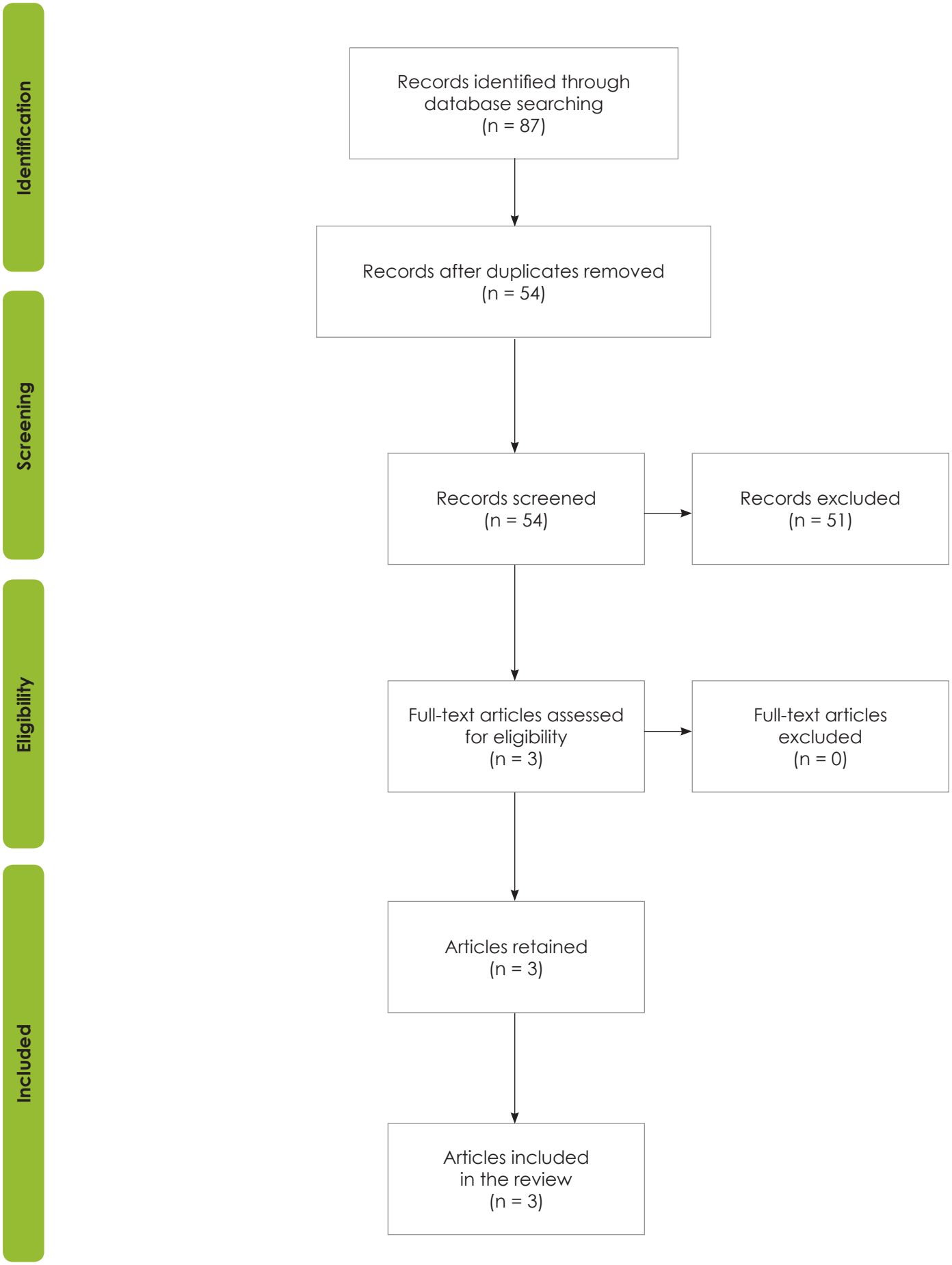


Figure 1b Article search and selection process for economic search



3.5 Data abstraction and critical appraisal

Identified publications were categorised as follows: empirical studies, reviews, discussion articles, pilot project reports, anecdotal reports on the implementation of tools, guidance/standards, and conference abstracts. Included empirical studies were critically examined with reference to several elements and the following information was extracted: objectives; study setting (country, healthcare setting); clinical setting; study participants; methodology; description of intervention, if reported; main outcome measures; results for the main outcome measures; limitations and any additional information that potentially affected the results.

Studies were assessed for internal validity using the Critical Appraisal Skills Programme (CASP) appraisal tools (http://www.casp-uk.net/) and the checklists supplied by Scottish Intercollegiate Guidelines Network (SIGN). Included guidelines and standards were assessed in accordance with The National Quality Assurance Criteria (Health Information and Quality Authority, 2011) using The National Quality Assurance Criteria Scoring Sheet to record results of appraisal. Details of the levels of evidence are provided in Annex 8 (in the literature section).

3.6 Study designs

Thirty-three review articles were identified through the literature search, seventeen of which were classified as systematic reviews (Arora *et al.* 2009; Riesenberg *et al.* 2009a; Riesenberg *et al.* 2009b; McArthur, 2010; Nagpal *et al.* 2010; Riesenberg. *et al.* 2010; Ong and Coiera, 2011; Foster and Manser, 2012; Segall *et al.* 2012; Flemming and Hubner, 2013; Li *et al.* 2013; Moller *et al.* 2013; Russ *et al.* 2013; Weldon *et al.* 2013; Abraham *et al.* 2014; Robertson *et al.* 2014; Sherman *et al.* 2013).

Ongoing systematic reviews were noted, and tracked. Two of these reviews (Robertson *et al.* 2014; Abraham *et al.* 2014), published after the original search was completed, were identified and subsequently included in the review.

The review studies are summarised in Table 2.

Table 2 Systematic reviews identified through the literature search. Studies which were rated for quality using the SIGN checklist are highlighted

Author	Setting/ Population	Review focus	Conclusions
Abraham *et al.*(2013)	Not specified	To examine the evaluation of handoff tools and the effectiveness and appropriateness of these tools to achieve standardisation	The majority of evaluation studies have been conducted in the US (73%) on physician-based electronic handoff tools (64%, both electronic and EMR-integrated). The authors highlighted the fact that most EMR-integrated handoff tools were built for specific departments and the impact of such tools in similar setting would require further evaluation. They note that the focus of evaluation was on the information processing capabilities of the tools, rather than capability to introduce resilience. The use of locally appropriate measures of quality to evaluate tools means that their impact on overall quality of care is largely unknown. They highlighted the limits of the evaluation studies, namely, the use of un-validated surveys or questionnaires, small sample of respondents, and reliance on users' recall Classify main handoff tools as : patient-problem model (SOAP), body-system or medical model (HAND-IT), or situation briefing model (SBAR)
Riesen-berg *et al. (2009a)*	Not specified	Identify mnemonics used during patient handoff	Majority of identified studies were anecdotal and discussed SBAR. Highlighted educational intervention on sign-out (Horwitz et al. 2007) as particularly well-designed – despite lack of validated instrument to evaluate- with potential to increase comfort with sign-out Highlighted need for more rigorous research designs to be used in this field.
Riesen-berg *et al.(2009b)*	All clinical settings in the US. Resident or attending physicians	Identify the barriers of, and strategies to improve handoff communication. Identify the features of structured handoffs that have been shown to be effective.	Identified 'relational' communication barriers as an issue between staff grades Identified the two main strategies for improv-ing handover as standardisation, and com-puterised solutions

Table 2 cont. Systematic reviews identified through the literature search. Studies which were rated for quality using the SIGN checklist are highlighted

Author	Setting/ Population	Review focus	Conclusions
Riesenberg *et al. (2010)*	All clinical settings in the US. Nursing staff.	Identify barriers of, and strategies to improve, handoff communication. Identify features of structured handoffs that have been shown to be effective.	Grouped the main strategies to improve handoff as: communication skills, environmental strategies, standardisation, training and education, involving staff (in the development of guidelines and protocols), and leadership. The authors conclude there is a lack of empirical evidence to support best practice for nursing handoff.
Ong *et al.(2011)*	Not specified	Identify studies investigating handoff communication between care providers during intra-hospital transfers	The intra-hospital handover involves additional complexity not present at shift handover. Team co-ordination is key but may be impeded by unpredictability of certain transfers. Information sharing between departments may be further complicated by intraward shift changes.
McArthur *et al.(2010)*	Nursing staff.	Identify qualitative studies exploring the experiences of nurses at the time of inter-shift nursing handoff	There may be incongruence among written records, verbal reports and patient observation. Reviewing the medical record and utilising a handover sheet are both important: Information contained in the record may be more comprehensive but nurses handover sheets may highlight information not contained in records e.g. emotional response of patients
Nagpal *et al. (2010)*	Surgical setting Any health profession.	Identify studies which assess inter-professional communication or identify communication failures in surgical or anaesthetic fields. Identify assessment tool for evaluating communication in surgical care.	There is no standardised tool currently available to specifically assess inter-professional communication in surgical care. Identified the main issues with communication, including the blurring of responsibility, lack of surgeon familiarity with patients, and staff hierarchies, or variability in teams and workflow patterns.
Flemming *et al. (2013)*	Not specified	Identify empirical studies to determine typical errors their consequences in shift handover To determine strategies and instruments to improve shift handover To examine the use of electronic systems in improving shift handover	Highlighted how oncoming staff often feel uncertain about what needs to be done on the shift, and about the care plan, or were not prepared for the events that happened during the shift. Report that neither verbal only handovers nor written handovers without face-to-face communication are ideal.

Table 2 cont. Systematic reviews identified through the literature search. Studies which were rated for quality using the SIGN checklist are highlighted

Author	Setting/ Population	Review focus	Conclusions
Arora *et al.(2009)*	Hospital setting Any health profession.	Identify controlled studies evaluating interventions to improve in-hospital handoffs Aim to make recommendations for hospitalist handoffs during shift change and service change.	The literature supports the use of a verbal handover supported with written documentation in either a structured format or an electronic application.
Foster *et al.(2012)*	Hospital setting Any health profession.	To summarize the evidence about patient handoff characteristics and their association with patient outcomes	Research on handovers is highly diverse such that no particular method of standardising handover sheets appears most effective.
Robertson *et al.* (2014)	Hospital setting Any health profession.	To evaluate interventions to improve the Intra-hospital handover process	Identified limitations of the available literature. Only two studies identified which used patient outcomes as a measure were able to report an impact.
Russ *et al.(2013)*	Surgical setting. Any health profession.	To examine the use of checklists to improve communication and teamwork in the OR	Identified a limitation of the available literature as a failure to associate how well a checklist was used (i.e., the quality of its implementation) with the impact on communication. Report that self-perceptions of teamwork and communication improved following implementation of checklist. Nursing personnel may perceive maximum benefit of team communication following checklist implementation. Report reduction in visible consequences of poor communication and near-misses associated with communication errors after the checklist implementation.
Segall *et al. (2012)*	Surgical or postoperative care setting. Any health profession.	Identify studies which make recommendations to improve the handover of care from the operating room to post-anaesthesia or intensive care units.	The quality of research on postoperative handovers is variable. To improve this process, the use of checklists and standardised protocols is recommended, limiting on non-patient specific discussions during handover, ensuring all relevant team members are present, and allowing each individual an opportunity to speak or ask questions.

Table 2 cont. Systematic reviews identified through the literature search. Studies which were rated for quality using the SIGN checklist are highlighted

Author	Setting/ Population	Review focus	Conclusions
Sherman *et al.* (2013)	Nursing staff	To determine the advantages and disadvantages of bedside nursing report.	The literature compromises largely of qualitative studies, with limited reporting of quantitative outcomes. Advantages of bedside report identified: patients more informed, involved in care, patient satisfaction increased, improved nurse/patient relationship, improved report efficiency, better prioritisation at start of shift, improved reporting accuracy. Some indication that falls are reduced. Disadvantages identified: shift report may take longer, patient difficulty with medical jargon, anxiety from too much or incorrect information, privacy concerns, anxiety related to hearing about their illness.
Li *et al.*(2011)	Hospital setting. Physicians.	To identify Computerised Handoff Tools (CHT) to support physician handoff.	The authors suggest that while CHT are promising tools, more rigorous study methodologies are needed to evaluate them. Positive impact of CHT on physician work efficiency. Less certain impact on handoff quality. Studies indicated that a ''to do'' list, outstanding investigation results, and patients' code status may be considered most important information to handoff.
Weldon *et al.*(2013)	Surgical setting. Any health profession.	To understand communication processes in the OR, with particular focus on observations rather than recollection.	Hierarchies within the OR is an important factor which impacts on communication. Creating 'safe' culture where staff feel able to speak up and question information is a key area requiring change.
Moller *et al.*(2013)	Postoperative setting. Any health profession.	To describe the characteristics and potential hazards to quality and patient safety during postoperative handover.	Local staff should be consulted when developing interventions for handover, to incorporate their preferences alongside guidance in order that the intervention works for their needs. There is a lack of long-term implementation considerations in the literature on postoperative handover interventions.

The literature search identified 104 studies which assessed current practice in communications or clinical handover, and three conference abstracts (Meisel *et al.* 2012; Chin *et al.* 2010; Bongaerts *et al.* 2012) The majority involved observations of practice, surveys of staff using questionnaire, focus group or semi-structured interviews with staff, or used a combination of interviews and direct observation. The remaining studies used a multi-methods approach, typically a combination of staff surveys, interviews, and observations. Two experimental studies compared communication modes (Pothier *et al.* 2005; Bhabra *et al.* 2007) and two performed a Failure Mode Effects Analysis (FMEA) (Redfern *et al.* 2009; Ong and Coiera, 2010). Eight of the identified studies were retrospective analyses of incident reports or malpractice claims (Beckmann *et al.* 2004; White *et al.* 2005; Greenberg *et al.* 2007; Kachalia *et al.* 2007; Singh *et al.* 2007; Bongaerts *et al.* 2012; Pezzolesi *et al.* 2010; Rabol *et al.* 2011).

The literature search identified 102 empirical studies which investigated the effectiveness of handover communication tools or practices, 17 were conference abstracts, and nine were reported as pilot studies, but were included here on the basis that they reported outcomes which may be of relevance to the present review (Lingard *et al.* 2005; Velji *et al.* 2008; Rice *et al.* 2010; Ryan *et al.* 2011; Takala *et al.* 2011; Iedema *et al.* 2012; Moseley *et al.* 2012; Petrovic *et al.* 2012; Sadri *et al.* 2014). One additional publication, a retrospective audit of shift handover forms completed after the implementation of a modified SBAR mnemonic, the CHAPS tool, was also reviewed, on the basis that the tool has been used on maternity units (Basu *et al.* 2011).

Of the publications which utilised research methods to investigate interventions, 77 employed a prospective before and after intervention design, and one used a controlled, randomised before-and-after intervention design (Weller *et al.* 2014). Eight intervention studies were randomised trials (Marshall *et al.* 2009; Cunningham *et al.* 2012; Joffe *et al.* 2013; Salzwedel *et al.* 2013; Bump *et al.* 2012;Van Eaton *et al.* 2012; Lee *et al.* 1996; Weiss *et al.* 2013). One study used a before-and-after design for the first stage, followed by a randomised trial for the second (Salzwedel *et al.* 2013). The remaining research designs included qualitative research designs (Lingard *et al.* 2005; Aase *et al.* 2011; Vardaman *et al*. 2012; Rice *et al.* 2010) a longitudinal study of three phased interventions (Craig *et al.* 2012b), and retrospective audit or post-intervention review of practice (Basu *et al.*2011; Arora *et al.* 2011; Mohammed *et al.* 2013; Johnson *et al.* 2011; Olm-Shipman *et al*. 2011; Vergales *et al.* 2014; Flanagan *et al*. 2009; Oroviogoicoechea *et al*. 2013; Sidlow *et al*. 2006; Staggers *et al*. 2011; Adams *et al.* 2011).

A large number of the identified publications discussed the use of tools to improve handover communications but were anecdotal in nature. For example, several reported on local pilot studies, the majority of which implemented SBAR (McFerran *et al.* 2005; Woodhall *et al.* 2008; Andreoli *et al.* 2010; Wycknoff *et al.* 2011; Manias and Tomlinson, 2011), ISBAR or a variation thereof, ISoBAR (Finnigan *et al.* 2010; Aldrich *et al.* 2012; Porteous *et al*. 2009), or described the development and pilot testing of new mnemonic tools (Starmer *et al.* 2012, Thomas and Donohue-Porter, 2012; Friesen *et al.* 2013; Hatten-Masterson *et al*. 2009; Iedema *et al*. 2010; Debenham, 2013; Yee *et al.* 2009). Numerous articles and discussion pieces were sourced which promoted the use of SBAR (Wentworth *et al.* 2012; Monroe, 2006; Pope, 2007; Ang, 2006; Groah, 2006; Guise and Lowe, 2006; Hemmila, 2006; Hohenhaus *et al.* 2006; Manning, 2006; Federwisch, 2007; Mikos, 2007; Powell, 2007; Sandlin, 2007; Sibbald and Ayello, 2007; Bello *et al.* 2011) or other mnemonics (Adams *et al.* 2012; Lamb *et al.* 2011; Owen and Candelier, 2010) but supplied little evidence to support their use. A full list of reported mnemonics is provided in Annex 5 (in the literature section).

3.7 Quality measures

According to Manser and Foster (2011) the quality of a clinical handover can be measured in terms of its content, process, or outcomes. Of the studies identified which tested the effectiveness of tools, the majority used handover content as a measure of quality, that is, they determined the

information elements which need to be transferred at handover, such as current management information and clinical assessments, and evaluated whether or not this was achieved and whether omissions had occurred.

Process measures may be environmental or behavioural. The majority of studies used the former, measuring either handover duration or the number of interruptions. A number of studies used behavioural process measures and assessed the quality of communication events, either rated objectively by an external assessor (Lingard *et al.* 2008; Cunningham *et al.* 2012; Abraham *et al.* 2013; Weiss *et al.* 2013), or subjectively self-rated by those undertaking the handover (Craig *et al.* 2012b; Craig *et al.* 2012a; Cunningham. *et al.* 2012; Graham *et al.* 2013). Other studies audited the uptake and use of the tool in question (Haig. *et al.* 2006), assessed team performance (Catchpole *et al.* 2013), or the length of time spent writing shift reports (Cornell *et al.* 2013).

Outcome measures may include satisfaction with the handover and other safety-relevant consequences. Several studies explored healthcare providers' perceptions of handover quality, the utility of the tool in question, patient safety culture, or team communication, which were assessed either via various survey instruments or elicited through group interview and discussions. Further studies assessed staff satisfaction with handover and several examined objective patient-related outcomes, although given the research designs, most changes could not be attributed to the tool being investigated. The main measures reported in the studies included the number of adverse events, incident reports, technical errors and patient length of stay (LOS)). The remaining measures included the number of High-Risk Events (HRE) (Zavalkoff *et al.* 2011), medication errors (Haig *et al.* 2006; Coutsouvelis *et al.* 2010), or unplanned Intensive Care Unit (ICU) transfers (De Meester *et al.* 2012).

3.8 Types of tools and practices evaluated in the literature

Forty-one studies that were identified evaluated the use of mnemonics, 27 evaluated standardised checklists or forms and 30 discussed the use of electronic tools to support handover. Nine remaining studies assessed multi-component protocols. Of those concerned with mnemonics, 22 evaluated SBAR and four evaluated ISBAR (Marshall *et al.* 2009; Thompson *et al.* 2011; Marshall *et al.* 2012; Mardegan *et al*. 2013), with the remainder discussing various other mnemonics, namely diNAMO (Rudiger-Sturchler *et al.* 2010), the 'ABC of handover'(Farhan *et al.* 2010), IMIST AMBO (Iedema *et al.* 2012), SOAP and HAND-IT (Abraham *et al.* 2013), deMIST (Talbot and Bleetman, 2007), IMOUTA (Connor *et al.* 2013), SIGNOUT (Bump *et al.* 2012), SAFE (Dharmadasa *et al*. 2013), SNAPPI (Weller *et al.* 2014), PACT (Tapia *et al.* 2013), SOUND (Gopwani *et al*. 2013), and the 7 Ps (Adams *et al.* 2011). One study evaluated the introduction of a guided four-step process to structure professional interactions, the format of which appeared to broadly correspond with SBAR (Rice *et al.* 2010). Of the studies which discussed standardised checklists or forms, four examined the use of a specific type of structured form which is used to record the aims of the clinical team for the day with respect to specific patients, and typically displayed on the ward or next to patient's bed to facilitate shared understanding and communication between staff members (Pronovost *et al.* 2003; Narasimham *et al*. 2006; Phipps and Thomas, 2007; Agarwal *et al.* 2008). One study evaluated the use of a structured checklist, referred to as a 'cognitive aid', which differed from typical checklists by additionally including prompts for the clinician to present a rationale for the daily plan handed over at shift change (Weiss *et al.* 2013). Eight studies developed and evaluated multi-component interventions (Aase *et al.* 2011; Catchpole *et al*. 2013; Starmer *et al.* 2013; Dingley *et al*. 2008; Johnson *et al.* 2011; Vergales *et al.* 2014; Olm-Shipman *et al*. 2011; Okafor *et al.* 2013; Sadri *et al.* 2014).

4. Findings

4.1 Guidance and standards for professional communication

The key standards of effective professional communication specify that it should be complete, concise, concrete, clear, and accurate (Table 3 (Victorian Quality Council, 2006). Some form of communication is required for almost every undertaking within the hospital setting, and the ability of healthcare professionals to communicate effectively is recognised by professional regulatory

and accreditation bodies, in Ireland (Medical Council, 2009, Nursing and Midwifery Board of Ireland, 2010a; Nursing and Midwifery Board of Ireland, 2010b; Nursing and Midwifery Board of Ireland, 2013; Radiographers Registration Board, 2013; Social Workers Registration Board, 2013) and elsewhere (Nursing and Midwifery Council, 2008; Health and Care Professions Council, 2012a; Health and Care Professions Council, 2012b; Australian Institute of Radiography, 2013; General Medical Council, 2013; Health and Care Professions Council, 2013; Australian Medical Board, 2014) as a critical skill to ensure quality and safety in healthcare.

Table 3 Five standards of effective communication, adapted from the Victorian Quality Council (2006)	
Complete	It answers all questions asked to a sufficient level to meet information needs of those involved in the exchange
Concise	Only relevant information is included. Unnecessary repetition is avoided
Concrete	The information communicated is specific, considered, and accurate
Clear	Jargon and obscure terminology are avoided and understandable language is used
Accurate	Ambiguous words or jargon is avoided. Discriminatory or patronising expressions are avoided

The Irish Medical Council considers 'communication and interpersonal skills' to be one of the eight core domains of good professional practice and in their code of conduct for registered medical practitioners (Irish Medical Council, 2009), indicate that when working in multidisciplinary teams, professionals should always maintain 'clear lines of communication' in order to protect patients. In a review of postgraduate medical education conducted on behalf of the Royal College of Physicians of Ireland, Imrie (2014) recommended the need to 'create and disseminate educational resources to teach [medical staff] safe and effective patient handovers'. In their guidance for nurses and midwives the Nursing and Midwifery Board of Ireland (NMBI) (2010a, 2010b, 2013) highlights the importance of collaboration, team-working, communication and documentation to ensure patient safety, and stipulates that all staff must be able to communicate effectively with other members of the healthcare team. Guidance for social workers produced by the Health and Social Care Professionals Council (HSCPC) (2013) indicates that professionals should both, understand and be able to demonstrate, effective communication processes in their conduct with other professionals.

Some of the available guidance is more prescriptive in terms of how communication should be best conducted among healthcare professionals. In their *Draft Code of Professional Conduct and Ethics for Registered Nurses and Registered Midwives*, the NMBI states that the values of mutual respect and trust should unpin communications between professionals (2013). It further states that communication of care should be carried out in a clear, objective, accurate and timely manner. The National Acute Medicine Programme report (Health Service Executive, 2010) outlines the need to promote a culture of courtesy and respect among professionals in acute services, and to develop a team-centred rather than hierarchical approach in order to benefit the patient. In their recently-updated *Code of Conduct for Australian Doctors*, the Australian Medical Board (AMB) (2014) recommends that communication with other professionals be clear,

effective, respectful and prompt. It further advocates mutual respect among staff members, specifically stating that doctors should acknowledge and respect the contribution of all healthcare professionals involved in patient care (Australian Medical Board, 2014). The need to respect the skills of team members during communication and collaboration is also highlighted in professional guidance from the General Medical Council (GMC) (2013) and the Nursing and Midwifery Council (NMC) (2008) in the UK. In their *Guidelines for Collaborative Maternity Care*, the National Health and Medical Research Council (2010) states that best-practice communication between professionals is reciprocal, that is, each professional receives and provides information.

Professional guidelines also outline the importance of information and responsibility transfer during communications. The AMB (2014) stipulates that 'sufficient' patient information should always be communicated at delegation, referral, and handover to ensure that the continuity of care is maintained. The NMC indicates that staff should keep their colleagues informed when sharing care of a patient (2008) and the GMC states that professionals should share 'all relevant information' both within and outside of their clinical team, when they go off duty, or when they refer or delegate care for their patients to other professionals (GMC, 2013). In their *Guidelines for the Provision of Anaesthetic Services*, the Royal College of Anaesthetists (RCoA) (2014) states that, in relation to post-operative care, relevant information must be handed over when patients are transferred from recovery to ward.

The importance of responsibility transfer is further highlighted by the GMC (2013) which places the onus on professionals to ensure, where practical, that once they have finished providing care to a patient, a named clinician or team has taken over responsibility for that patient. Guidance provided by the NBMI (2013), AMB (2014), NMC (2008) and RCoA (2014) outlines that professionals should, where possible, ensure that the person to whom they delegate, refer or handover a patient is suitably qualified, experienced, and knowledgeable to provide the care required. In their publication *Leadership and management for all doctors*, the GMC (2012) indicate that professionals should not 'assume' that another team member will pass on the information needed for patient care, that professionals should ensure they have a clear understanding about responsibility for communicating information, and what is expected of them during handover.

Some of the available guidance indicates that professionals must have the ability to choose a communication mode most suitable for a given scenario. Best practice guidance for social workers (Social Workers Registration Board, 2013) stipulates that professionals should be able to use 'appropriate' forms of verbal and non-verbal communication, both with service users and others. Professional practice standards for radiographers, developed by the Australian Institute of Radiography (AIR) (2013), states that professionals should be able to 'adjust communication effectively in diverse contexts', choosing the most appropriate communication technique for the given scenario, using verbal, non-verbal and written communication where suitable.

According to these standards, radiographers should be aware of key communication barriers present in the healthcare environment and strategies to overcome them; the Radiographers Registration Board (2013) recommends that professionals confirm that the information which they communicate has been correctly understood by receiving parties. The GMC (2012) recommends that if professionals identify problems associated with poor communication practices or unclear responsibilities, they should act to address them.

However, adhering to these professional standards may prove difficult given the 'historical compartmentalised approach' established by specialty medicine, referred to by the Royal College of Physicians (RCP) in their *Future Hospital Report* (Future Hospital Commission, 2013). Clinical staff within given specialties often work separately from one other and Arora *et al*. (2008) have suggested that, as hospital medicine becomes increasingly more specialised, achieving coordinated care is a key challenge, one which may demand more time of clinicians and managers as they strive to achieve best practice, as set out by the majority of available professional regulatory bodies. In spite of best efforts, the delivery of continuous and holistic care can often be

impeded by poor communication between specialist disciplines with consequences for patient safety; these consequences are discussed in the sections that follow.

4.2 Communication within maternity services

Care of a pregnant woman may involve multiple transitions, both between different care settings and different clinicians, including but not limited to: handover from one professional to another, handovers at the time of shift changes, and during emergency situations (Kings Fund, 2008). As such, it is essential to establish clear and effective communication between collaborating professionals within maternity teams, particularly as, in recent years, maternity services have come under scrutiny with respect to patient safety. Several key reports have indicated that failures in communication processes may have acted as causal or contributory factors in maternal deaths (Royal College of Obstetricians and Gynaecologists, 2004; West Midlands Perinatal Institute, 2010; Health Information and Quality Authority, 2013) and infant death and injury (Joint Commission, 2004).

When complications arise during labour or the intrapartum period, additional demands may be placed on clinical teams who are required to collaborate and communicate rapidly and effectively across different, and sometimes largely autonomous, specialties, including midwives, obstetricians, anaesthetists, paediatricians, and support staff (Kings Fund, 2012). Effective and standardised communication processes may be particularly important in scenarios when a patient must be escalated to a higher level of care (Cantwell *et al.* 2011; Department of Health, 2014). A report from the Australian Commission for Safety and Quality in Healthcare (ACSQHC) (2011a) indicated that problems with escalating care may be due to a lack of familiarity between members of a maternity team, while the Confidential Enquiry into Maternal Deaths has suggested that the absence of 'meticulous' handover communication between doctors may lead to a failure to recognise a woman's deteriorating clinical status (Cantwell *et al.* 2011). Research by the National Perinatal Institute into severe maternal morbidity cases (National Perinatal Epidemiology Centre, 2011) highlighted 'a multidisciplinary approach with good interdisciplinary communication' as an example of good practice among clinical teams when responding to cases of Maternal Obstetric Haemorrhage (MOH), and cited the importance of achieving clear communication between the obstetric and haematology teams, and using a specific proforma in order to fully document care management during these types of critical events.

A number of guidance documents and national standards point to the need for effective communication between team members, as well as with women and their families, to promote quality and safety in maternity care (Department of Health, Social Services and Public Safety, 2012; Institute of Obstetricians and Gynaecologists, 2006; Royal College of Obstetricians and Gynaecologists, 2007; Kings Fund, 2008; Royal College of Obstetricians and Gynaecologists, 2008; American Medical Association, 2011; Royal Australian and New Zealand College of Obstetricians and Gynaecologists, 2011; National Health and Medical Research Council, 2010). In their clinical governance advice on risk management, the Royal College of Obstetricians and Gynaecologists (RCOG) (2009) recommends that, to deliver safe maternity care, a focus on effective communication, handover, and standardisation is necessary. Although the requirement for good communication practices between members of the maternity team is not explicitly stated, in their Standards for Maternity Services in Ireland 2006-2016, the Institute for Obstetricians and Gynaecologists (2006) recognises the need to support a multidisciplinary team approach to patient care on maternity wards. In the their *Minimum Standards for the Organisation and Delivery of Care in Labour* (Royal College of Obstetricians and Gynaecologists, 2007), and *Standards for Maternity Care* (Royal College of Obstetricians and Gynaecologists, 2008), the Royal Colleges of Physicians, Midwives, Obstetricians and Gynaecologists, Anaesthetists, Paediatrics and Child Health outline that an effective relationship between multidisciplinary maternity teams requires 'mutual respect, a shared philosophy of care and a clear organisational structure with clear and explicit lines of communication'. In their position statement on professional standards,

the International Federation of Gynaecology and Obstetrics (FIGO) (2009) also states that **interactions between obstetricians, gynaecologists and other health professionals** should be 'respectful and considerate', and that professionals working in maternity care should recognise the competencies of other team members. The National Health and Medical Research Council (NHMRC) (2010) states that, in respecting each other's competencies and roles, professionals must feel in a position to offer their opinion and views, such that collaborative care is fully achieved; generating assertiveness among maternity care professionals will mean decisions are based on a consensus. The NHMRC further states that communication should be clear, with due regard to privacy and confidentiality, and that collaboration and teamwork is needed to reduce errors and drive efficiency and improvements in maternity care.

Guidance from the Royal College of Anaesthetists (RCoA) (2014) on best practice in obstetric anaesthesia, recommends the use of team briefings and use of the WHO checklist on the labour ward 'to promote good communication and team working and reduce adverse incidents'. The RCoA states: 'assertiveness also goes hand in hand with cooperation. Respect for one another's professional approach includes being able to present opinions and viewpoints in a manner that fosters the integration of all approaches and results in a solution.'

4.3 Communication and patient safety

Patient safety within healthcare services has become the focus of several quality improvement initiatives worldwide (Agency for Healthcare Research and Quality, 2013; Patient Safety First, 2014a; World health Organisation, 2014; McFerran. *et al.* 2005; Health Foundation, 2011). This has been driven, in part, by seminal reports that highlighted how error within health services results from poorly designed systems and processes and point to the need for rigorous professional standards and work practices to mitigate preventable errors and the subsequent impact they can have on patient care (Department of Health (UK), 2000; Kohn, 2000). In its White Paper entitled *Together for Health: A Strategic Approach for the EU 2008-2013*, the European Commission identified patient safety as an area for action, launching the Joint Action on Patient Safety and Quality of Care in 2012 to further develop patient safety programmes within EU member states (European Commission, 2012).

Poor clinical communication during patient care has long been acknowledged as a factor which contributes to avoidable error and adverse patient safety incidents (Beckmann. *et al.* 1996; Department of Health (UK), 2000; National Patient Safety Agency, 2007a, 2007b; Joint Commission, 2007; Australian Commission on Safety and Quality in Healthcare, 2011). As outlined in the *Future Hospital* report, the lack of effective communication systems to share patient information places patients at a disadvantage, risking delays or inadequate diagnosis (Future Hospital Commission, 2013). As highlighted by two reports from the National Patient Safety Agency (NPSA) in the UK (2007a, 2007b), this is particularly important in the context of communicating about the deteriorating patient. Launched by the World Health Organisation, the Action on Patient Safety project identified communication failures as one of five core issues of concern in relation to patient safety and identified transitions of care, when responsibility for patients and relevant clinical information is transferred, as a global priority for patient safety research (World Health Organisation, 2014; World Health Organisation, 2008).

In Ireland, the patient safety agenda has been prioritised in the HSE Annual Service Plan 2014 (Health Service Executive, 2014), and this is further evidenced in the creation of the National Patient Safety Advisory Group, which provides direction for quality improvement projects in relation to patient safety, as conducted under the Patient Safety First Initiative, and the establishment of the Commission on Patient Safety and Quality Assurance (CPSQA) (Department of Health, 2014b). In their report which examined national incidents and adverse patient safety events, the Commission (Department of Health and Children, 2008) identified poor communication processes as one of the key issues within the Irish health service, reporting that clinical errors occur when patients are

transferred across 'boundaries of care', either between care services or between two disciplinary providers of care. The report highlighted how errors result largely from communication failures, namely a lack of clear guidance on how care should be handed over and a lack of clarity with respect to the point at which responsibility for patient care has been transferred.

4.4 Quality assurance in healthcare

In line with the agenda on patient safety, ensuring quality and safety within healthcare organisations has also become a priority, both in Ireland and internationally. In 2008 the Commission on Patient Safety and Quality Assurance highlighted the lack of a formal system at national level to set quality assurance standards for evidence-based guidelines (Department of Health and Children, 2008). This deficit has been partly addressed with the implementation of the National Framework for Clinical Effectiveness (Health Information and Quality Authority, 2011) and the enactment of the Health Act 2007 (Government of Ireland, 2007), which conferred on HIQA the authority to set and monitor compliance with national standards for the quality and safety of health and social care services.

According to HIQA, quality and safety are driven by three core factors: self-regulation and professionalism, independent regulation, and consumer influence and market forces (Health Information and Quality Authority, 2010). In their 2008 report, the Commission on Patient Safety and Quality Assurance indicated that professional self-regulation is often perceived as protecting the interests of professional groups rather than maintaining standards of care and, as such, offers poor public accountability (Department of Health and Children, 2008). However, the enactment of several pieces of legislation, namely the Health and Social Care Professionals Act 2005, Medical Practitioners Act 2007, the Pharmacy Act 2007 and the Nurses and Midwives Act 2011, represents reform in this respect (Department of Health and Children, 2008). Setting independent national regulatory standards for safe and effective healthcare, guides the delivery of health services, facilitates comparison across organisations, and enables the monitoring of compliance with these standards (Department of Health and Children, 2008; Health Information and Quality Authority, 2012).

National standards can serve not only to assure safety and quality, but also to highlight issues of concern, allowing improvement programmes to be developed in response to deficiencies in the health system (Australian Commission on Safety and Quality in Healthcare, 2012; Health Information and Quality Authority, 2012). However, in order to establish and maintain safety and quality standards, a robust system of governance and accountability must be in place, along with clear procedures which outline how quality will be measured (Department of Health and Children, 2008; Health Information and Quality Authority, 2012). The concept of quality is recognisably complex (Raleigh and Foot, 2010) and, as originally proposed by Donabedian, can be measured at three levels: structure, process and outcome (Donabedian, 1988). Key performance indicators (KPI) are the 'specific and measurable' elements of the structure, process or outcomes within health services, which, while not directly measuring the quality of the service, serve to draw attention to where standards of care are not being met, promoting accountability of healthcare providers and allowing them to be compared with one another, in terms of the quality of care they deliver (Health Information and Quality Authority, 2010). While some debate exists around whether measuring the process or outcome of care is preferable, (Rubin *et al.* 2001; Raleigh and Foot, 2010), in theory, an understanding of all three measures may enable clearer links to be established between features of the organisation and available resources, the mechanisms through which care is delivered, and the consequential impact on the patient (Donabedian, 1988). This has the potential to generate a more robust understanding of the system, allowing vulnerable points to be better addressed and monitored for improvement (Raleigh and Foot, 2010).

In its *National Standards for Safer, Better Healthcare*, the HIQA has recognised that effective clinical handover is key to achieving quality in the healthcare system. Following a review of the international literature the HIQA outlines the key domains of quality healthcare as: safe, effective, person-centred, equitable, and efficient (Health Information and Quality Authority, 2012). The HIQA refers to clinical handover under Standard 2: Effective Care and Support, stipulating that healthcare organisations must undertake 'timely, formal handover of information and accountability for the overall care of a service user when they move within or between services and the responsible healthcare professional changes ... making explicit the change of healthcare professional and documenting this'. The standards further indicate that all relevant clinical information needs to be available at the point of care, and that healthcare services should be able to demonstrate that relevant information is being shared 'in a timely and appropriate manner to facilitate the transfer or sharing of care within and between multidisciplinary healthcare teams and services from referral through to transfer or discharge'.

4.5 Communication and handover processes

4.5.1 Definition of clinical handover

Clinical handover, also referred to in the literature as handoff and, when used in relation to shift handover, as shift change, sign-out, inter-shift report and shift report, is defined by the National Patient Safety Agency (NPSA) and the British Medical Association (BMA) in their guidance on clinical handover (2004) as:

> 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.

However, this definition is not universally recognised (Wong *et al.* 2008) and, as Cohen and Hilligoss (2010) have pointed out, some ambiguity exists around the definition, particularly in relation to the transfer of responsibility. While used interchangeably with handover, handoff is often used to refer to scenarios in which responsibility is *not* transferred, such as the transfer of radiological reports (Cohen and Hilligoss, 2010). Furthermore, the definition of handoff used by the Joint Commission, a healthcare accreditation body in the US, does not imply the transfer of responsibility, but instead focuses on accuracy (Cohen and Hilligoss, 2010):

> The primary objective of a hand-off is to provide accurate information about a patient's care, treatment, and services; current condition; and any recent or anticipated changes. The information communicated during a hand-off must be accurate in order to meet (patient) safety goals.

For the purposes of this review, a definition of handover which incorporates both the transfer of patient information and clinical responsibility will be used.

4.5.2 Types of clinical handover

While the handover communications discussed in the literature, for the most part, refer to that which occurs at shift change (Hilligoss and Cohen, 2013), clinical handover may vary with reference to three aspects: 1 the situation (shift change, inter- or intra-hospital transfer, or admission, referral or discharge); 2 the method (face-to-face, via telephone, via written orders, or aided by electronic handover tools); and 3 the location (at the bedside, in a common staff area, or at the hospital reception) (Australian Commission on Safety and Quality in Healthcare, 2012). Handover at shift change may also vary by time and handover between day and night teams has been recognised as a process which may require greater time and a more comprehensive exchange of information (NSW Department of Health, 2010). In a discussion of existing handover research,

Riesenberg (2012) proposes four distinct handover phases, as follows: 1 pre-work, i.e. anticipating and preparing for handover; 2 handover; 3 acknowledgement of information received; and 4 acknowledgement of the transfer of responsibility. With reference to shift handover, these phases can apply to the different forms of handover, which occur in the context of a patient's care, with the possible exception of the first phase, which partly assumes that handover is scheduled. However, an aspect often lacking is between-unit handovers when care may be handed off from one clinical team to another, or escalated to a higher level of care, in response to a change in the patient's condition.

The unscheduled nature of this handover 'trigger' is one of the challenges that Hilligoss and Cohen (2013) point to, arguing that despite being under researched in the literature, handovers which occur when a patient is transferred *between* distinct units of a hospital are particularly high-risk and are often accompanied by additional contextual factors, which make them more difficult to navigate. As Beach *et al.* (2012) highlight, different professional disciplines may have a different focus during communications and may 'fundamentally differ in their need for detail, clarity, completeness and closure'. A further challenge is the fact that communication during between-unit handovers often involves professionals of distinct specialities who may not have established working relationships. According to Hilligoss and Cohen (2013) this can complicate negotiations in relation to the transfer of patient responsibility and the clinical tasks to be completed by each clinical team, aspects that would be taken for granted in the context of handover at shift change. Hilligoss and Cohen (2013) further suggest that these negotiations are particularly sensitive to the prevailing organisational policies, or lack thereof, which govern handover protocols. While between-unit handovers typically involve only the transfer of a single patient, and therefore do not require the level of coordination of shift change where multiple patient transfers occur, they place different demands on staff, who may need to coordinate the transfer of equipment and patient charts, while simultaneously communicating critical clinical information.

The distinct differences between handover types are of particular relevance when considering methods to improve handover communication (Riesenberg, 2012). As such, when judging the effectiveness of any handover communication protocol or tool, it is important to first consider some key aspects of the handover (Behara *et al.* 2005; Cheung *et al.* 2010), namely: the type of process in which it occurs (e.g. at shift change, between units); the primary content, i.e. the relative importance of the three elements to be handed over: information, authority, and responsibilities; structural issues, i.e. the nature of the participants, their expertise and specialities, patient complexity and whether their presentation conforms to typically observed patterns; and dynamic issues, i.e. the position of the given process in the wider context, including consideration for simultaneously occurring activities, the time available, the location of handover, and patient volume. Smith *et al*. (2008) suggest that handover is an 'informal and locally negotiated' process, influenced by the contextual demands, and therefore some degree of flexibility is required when striving to improve the process.

4.5.3 Purposes of handover

Handover serves many purposes and has been described as a 'multi-dimensional' concept (Manser, 2011), a complex adaptive process (Johnson *et al.* 2011), which sits at the intersection of responsibility and accountability, system and information transfer (Jeffcott *et al.*, 2009). While the main purpose of handover may be to exchange patient information, handover also has social, educational, organisational and planning functions (Kerr, 2002, McFetridge *et al.* 2007). Referring to handover between anaesthetists and nursing staff in the recovery room, Smith *et al.* (2008) write that the handover achieves three objectives. It conveys anaesthetists' knowledge of perioperative care to nursing staff, it marks the transitions of responsibility, and it acts as an 'audit point' to review and plan for further care. Handovers not only involve the transfer of patient information, but have further utility, in terms of debriefing, updating clinical knowledge, team building (Kerr, 2002; McFetridge *et al.* 2007; Riesenberg 2012), providing a platform for discussion and elaborations on the information transferred (Kerr, 2002; Wilson *et al.* 2005) and serving as a

point of audit or verification (Wilson. *et al.* 2005; Smith. *et al.* 2008; Manser, 2011). They also provide resilience, that is the ability to understand how failure is avoided and how success is obtained within complex and high-risk organisations (Kalkman, 2010), allowing information to be confirmed and errors mitigated. As Cohen and Hilligoss (2010) point out, the multi-disciplinary interactions which occur during between-unit handovers, in particular, may facilitate a comparison of viewpoints on the patient's condition, potentially allowing errors to be resolved; as Perry *et al.* (2008) suggest, these interactions provide an opportunity for 'fresh eyes' to review the clinical situation. Edozien (2011) suggests that shift handover should be promoted as a safety checkpoint, by including a 'safety scan' of new or inexperienced staff and 'organisational issues', both of which form part of their Structured Multidisciplinary Intershift Handover (SMITH), a framework for structuring pre-handover, handover and post-handover among maternity teams.

Manser and Foster (2011) write that the way that the impact of improvements on handover quality is assessed depends on what the main purpose of the handover in a given scenario is believed to be; they suggest that the purpose can be the transfer of information, the establishment of shared decision making, or the transfer of responsibility. While handover may be assessed with reference to content, process or outcomes, it is evident that most of the research literature judges the quality of handover communications based primarily on the transfer of information *content* (Cheung *et al.* 2010; Manser, 2011; Manser and Foster, 2011). This is a limited approach, which fails to account for the wider purposes of handover, and cannot provide a robust evaluation of the effectiveness of handover protocols in terms of patient safety, the maintenance of which is the ultimate goal of improvements in professional communication practices.

4.5.4 Handover improvement initiatives

Efforts to enhance handover and professional communication processes have formed a key component of a number of clinical improvement initiatives worldwide. Among these was the Australian National Clinical Handover Initiative, instituted by the Australian Commission in Quality and Safety in Healthcare (ACQSHC) (2011) following the launch of the World Health Organisation (WHO) Action on Patient Safety Project, Global Priorities for Patient Safety Research (2008, 2009) and the creation of the Patient Safety Alliance High 5s Initiative (World Health Organisation, 2014), which aimed to target five core issues of concern in relation to patient safety, the so-called 'High 5s', one of which was communication failures during patient handovers. Another initiative was the European Handover Initiative (2014), launched in 2008 and co-funded by the European Union's Seventh Framework Programme (FP7-HEALTH-F2-2008-223409), which focuses on improving handover between secondary and primary care services.

Under the Australian initiative, numerous pilot programs have been rolled out nationally and evaluated (Australian Commission on Safety and Quality in Healthcare, 2011b), leading to the development of several key guidance documents on handover, including the OSSIE Guide to Clinical Handover Improvement (Australian Commission on Safety and Quality in Healthcare,2014, 2010b), an implementation toolkit for clinical handover improvements (Australian Commission on Safety and Quality in Healthcare, 2011c), and the establishment of the Handover: Enabling Learning in Communication (for) Safety (HELiCS) approach to handover learning and improvement (Iedema and Merrick, 2009), whereby healthcare professionals can view their videotaped handovers and make improvements accordingly. Handover and communication has also been a focus of the Australian in Safe Hands programme, developed by the Clinical Excellence Commission (CEC), which aims to improve the efficiency of healthcare teams (2011). Both the CEC and the Australian Clinical Handover Initiative have recommended the ISBAR (Identify-Situation-Background-Assessment-Recommendation) tool (Annex 3 in the literature section).

In the UK, the Safer Births Project, led by The Kings Fund, and the Hospital at Night programme, one component of which was concerned with handovers from night-time covering staff, both advocate the use of the SBAR(Situation-Background-Assessment-Recommendation) tool

(Annex 3 in the literature section) (Institute for Healthcare Improvement, 2007; Kings Fund, 2012). Improvements in clinical handover have also been the focus of Phase II of the UK charity's Health Foundation's Safer Clinical Systems initiative (Health Foundation, 2014), and Safer Maternity Services programme (Health Foundation, 2010). One pilot project, conducted as part of the former initiative, restructured day-to-night handover on the paediatric ward of a National Health Service (NHS) Foundation Trust, introducing a Safer Handover Bundle supported by a staff training and incorporating the use of the I-PASS (Illness severity-Patient summary-Action list-Situation awareness and contingency planning-Synthesis by receiver) tool (Annex 3 in the literature section) (Debenham, 2013). As part of the Safer Maternity Services programme, the SBAR tool has been introduced at four NHS Trusts in the UK (Health Foundation, 2010). The Patient Safety First Initiative in the UK has also recommended the use of SBAR in order to improve communication processes and reduce harm for the deteriorating patient (Patient Safety First, 2008), with one NHS Trust utilising the tool to frame communications about a patient's critical care (National Patient Safety Agency, 2007).

In the US, as part of the KP Perinatal Patient Safety Project (McFerran. *et al.* 2005), the SBAR tool, along with other elements, including Critical Events Team Training (CETT), has been implemented at several sites. The SBAR tool was also advocated for use by the Transforming Care at Bedside (TCAB) initiative, led jointly by the Institute for Health Improvement and the Robert Wood Johnson Foundation (Lee *et al.* 2008). The TCAB, which ran from 2003 to 2008, was a multisite programme to develop and test new strategies to improve teamwork and communication practices among professionals. The programme focused on three main approaches to improve handover, namely, encouraging briefings and debriefings or 'huddles', using structured handovers, and conducting change of shift reports at the bedside. The I-PASS study, a multisite initiative led by several partners, focused on developing handover improvements in paediatric care (Harvard University Medical School, 2013).

4.5.5 Guidance and standards in relation to clinical handover

Several official professional representative bodies have published guidelines on communication and handover. In an evaluation report on the National Handover Initiative, the Australian Commission for Safety and Quality in Healthcare (ACSQHC) (2011) referred to the disparity between professional regulatory bodies, in terms of the level of guidance they provide on clinical handover. The Commission reported that while three bodies, the Royal Australasian College of Physicians, the Royal Australian College of Obstetricians and Gynaecologists and the Royal Australasian College of Surgeons, provide no guidance on clinical handover, the Australian and New Zealand College of Anaesthetists have specific guidelines, recommendations and minimum standards relating to clinical handover (2013), as do the Royal Australian College of General Practitioners (2013), which include specific criteria for conducting telephone and electronic referrals and follow up of tests and results. In the UK, the Royal Colleges of Physicians (2004, 2011), Surgeons (2007), Obstetricians and Gynaecologists (2010), and Paediatrics and Child Health (2005) each provides its own publications on handover communications, most of which refer to the guidance provided by the British Medical Association's (BMA), *Safe Handover: Safe Patients* guidelines (2004), which have also been adapted and used by the Australian Medical Association (AMA) (2006).

Strategies and standards for best practice handover and during-care transitions have also been provided by official bodies, including the following: ACQSHC (2010a, 2010b, 2012)[Wong, 2008 #4955], the Western Australia (WA) Health Department (2013), the Department of Health (South Australia) (SA Health) (2013a, 2013b), the Australian Healthcare and Hospitals Association (AHHA) (2009), the Joint Commission, a national accreditation body in the US (2006), the Australian Congress of Obstetricians and Gynaecologists (2012), the Association of PeriOperative Registered Nurses (AORN) (2012), the World Health Organisation (WHO) (2009), the New South Wales Department of Health (NSW Health) (2009, 2010), and the Australian Resource Centre for Healthcare Innovations (ARCHI) (2008b). ARCHI provides a useful matrix to aid decisions regarding

the most appropriate form of clinical handover for a given clinical situation (ARCHI 2008b). Now no longer operational, the former Victorian Quality Council (2006) provided several resources, including an organisational clinical handover (CH) readiness checklist, a suggested CH template, suggested content for a CH policy, and suggested content for a CH protocol or guidelines. A list of handover resources is included in Annex 4 (in the literature section.

In terms of supporting handover, the available guidance indicates that shift handover is a process which should be facilitated at an organisational level (British Medical Association, 2004) by factors that include: planning overlapping shifts (British Medical Association, 2004; NSW Department of Health, 2010), providing an adequate environment in which to conduct handover (British Medical Association, 2004; Royal College of Paediatrics and Child Health, 2005; Department of Health (Western Australia), 2013), and making information readily accessible via reliable IT infrastructure (British Medical Association, 2004; Royal College of Physicians, 2004; Department of Health (Western Australia), 2013). As a process which is highly dependent on features of the organisational culture and structure in which it occurs, clinical handover needs to be supported by local policies and guidance, which extend to the wider organisation rather than just the healthcare professionals directly engaged in handover (British Medical Association, 2004; Australian Commission on Safety and Quality in Healthcare, 2012), and which may serve to highlight for staff the value and importance of the practice (NSW Department of Health, 2009). It is suggested that policies should potentially formalise attendance at handover and specify the staff who should be present, defining their roles and responsibilities in the handover process and ensuring clarity around this aspect (NSW Department of Health, 2010; Department of Health (South Australia), 2013a). The ACQSHC (2013) proposes that while healthcare organisations need an overarching policy which outlines how clinical handover should be conducted, achieving 'flexible standardisation' is the key in ensuring that 'policies and procedures are relevant and appropriate for use in particular contexts of handover'. Staff should be trained and educated in site policies for handover (Department of Health (South Australia), 2013a; Department of Health (Western Australia), 2013), and training in handover should be included in staff orientation (Department of Health (South Australia), 2013a)

In *Good Practice in Handover*, the Royal College of Paediatrics and Child Health (2005) states that each healthcare organisation should identify which staff are relevant to attend shift handover, including grades and specialties, and that attendance at handover should take priority over all other work except emergencies. The BMA (2004) recommends that key handover to or from the night team should be multidisciplinary, while local handovers on units can involve fewer staff. The Department of Health (Western Australia) policy for clinical handover (2013) proposes that all staff should be educated on the site or service handover protocol and that a handover policy should encompass the following core principles: patient/carer involvement, consistent structure and content, leadership and complete team involvement, agreement on responsibilities and accountability, appropriate modality, appropriate environment, supporting documentation, patients of concern, and education.

In terms of conduct, several authors and official bodies recommend that shift handover should take place in ideal circumstances with reference to timing and location. It is suggested that handover should take place at a fixed time, allowing sufficient 'protected' time (NSW Department of Health, 2009; British Medical Association, 2004; Royal College of Physicians, 2004; Royal College of Paediatrics and Child Health, 2005; Joint Commission, 2006; Royal College of Surgeons of England, 2007; Australian Commission on Safety and Quality in Healthcare, 2012). It should take place close to the areas of work that are most frequently used (British Medical Association, 2004), in an area large enough for all relevant staff to attend (British Medical Association, 2004) and in an area free from interruptions and distractions (British Medical Association, 2004; Joint Commission, 2006; Royal College of Surgeons of England, 2007; American College of Obstetricians and Gynecologists, 2012). The location of handover should also have access to supplementary clinical information, such as lab results, X-rays and so forth (British Medical Association, 2004; Department of Health (Western Australia), 2013).

In its key principles for clinical handover, NSW Health (2009) recommend that for any handover, a time should be ideally agreed and an appropriate location set, including, if appropriate, at the bedside. The Cincinnati Children's Hospital Medical Center (CCHMC) (Barker, 2013) issued a best-evidence statement on bedside reporting, recommending that nursing shift handover reports be conducted at the bedside in order to increase patient satisfaction. South Australia Health (2013a, 2013b) recommends that patient involvement in handover should be supported and Western Australia Health (2013) similarly recommends that, where feasible, handover should be conducted in the presence of the patient. However, in accordance with guidance issued by NSW Health (2009), professional judgement should be used in connection with the information that is appropriate to hand over, in order to uphold patient privacy. Some information may also not be appropriate to hand over in the patient's presence. Guidance issued by Queensland Health (2013) in the form of a bedside nursing handover checklist outlines how certain, sensitive information, such as test results, mental health issues, communicable diseases, 'not-for-resuscitation' (NFR) orders, social and family issues and so forth, should be handed over in a designated area with a handover checklist and not at the patient's bedside.

Chaboyer and colleagues produced a Standard Operating Procedure for nursing bedside handover for the ACSHC (2008) after observing 500 handovers and interviewing over 30 nurses and propose that bedside handover increases the accuracy of information and allows for priority areas to be identified, as nurses can visualise the patient. They propose a five-step bedside handover process: preparation, including asking visitors to leave; introduction; information exchange; patient involvement, such as inviting patients to confirm or clarify information; and safety scan. An electronically-generated handover sheet, tailored to the needs of the particular clinical department, is recommended for use during bedside handovers, as is a mnemonic tool, such as SBAR or ISoBAR, to prompt information sharing. The Agency for Healthcare Research and Quality (AHRQ) (2013) has provided an implementation toolkit for nursing bedside report.

Several official bodies recommend that handover should comprise a written pro forma, complemented by face-to-face verbal handover (British Medical Association, 2004; Department of Health (Western Australia), 2013; Department of Health (South Australia), 2013a). Providing written guidelines for handover content, using a prepared handover sheet and regular review of handover processes and tools are seen as key factors in achieving safe and continuous patient care (RCOG, 2010). In its quality standards, the ACSQHC (2012) also supports regular review of handover processes and tools and further recommends that such reviews be carried out in collaboration with clinicians, patients and carers. Handover should be monitored, evaluated and reported to a recognised clinical governance body (Department of Health (South Australia), 2013a). High risk handover scenarios, in particular, should be identified and monitored for the effectiveness of the process (Department of Health (South Australia), 2013a)

Official bodies have also issued guidance on the conduct of clinical handover. 'Good handovers' should: seek to facilitate team discussion, with one speaker at a time (Royal College of Surgeons of England, 2007); be potentially managed by a nominated leader (NSW Department of Health, 2009; British Medical Association, 2006), preferably a senior clinician (Royal College of Paediatrics and Child Health, 2005; Department of Health (Western Australian), 2013; Department of Health (South Australia), 2013a); and clarify how the physician responsible for a named patient may be contacted (The Royal College of Surgeons of England, 2007). Clinical handover should also generate awareness of relevant risks by including a short briefing to facilitate situational awareness among staff, outlining the plan and staff expectations for the oncoming shift (Royal College of Surgeons of England, 2007). The Joint Commission and the WHO both recommend the use of 'read back' to ensure a common understanding of expectations (Brown, 2004; Joint Commission, 2006; World Health Organisation, 2009). The Royal College of Physicians further suggests that handover can act as a training and educational exercise (RCP, 2004), particularly if the practice of team handover can be encouraged, such that handover does not occur solely between clinicians of similar grade level. Shift handover may also be conducted in the context of the medical

ward round, which is recognised in guidance from the Royal College of Physicians and the Royal College of Nursing (RCN), as a 'complex clinical process, serving multiple purposes, including, but not limited to, cultivating multidisciplinary decision making with respect to patient care, and training junior members of staff' (Royal College of Physicians and Royal College of Nursing, 2012). The Australian Congress of Obstetricians and Gynaecologists (2012) recommends that junior staff members should be encouraged to participate in and contribute to the transfer of information at handover. The guidance proffered by these official bodies recognises good communication as a key component of effective ward rounds, and recommends that professionals adopt a structured approach, employing the use of a handover tool.

In terms of content, the use of subjective language, jargon and unfamiliar or approved abbreviations should be avoided during handover (British Medical Association, 2004, Department of Health (Western Australia), 2013); the Joint Commission (2013) issued a list of abbreviations to be avoided during professional communications. The importance of handing-over 'essential' information is also highlighted in recommendations on handover content (The Royal College of Surgeons of England 2007; World Health Organisation. 2009). As recommended by the Australian Healthcare and Hospitals Association (2009), workforce diversity is important to respect in the adoption of effective clinical handover models and processes, that is, acknowledging that English may not be the first language of some staff members.

Suggestions to standardise and structure the handover process are included in some of the available guidance. However, the Australian Healthcare and Hospitals Association (2009) recommends that while national models and processes to standardise handover are required, they should incorporate flexibility in order to accommodate contextual elements of the local ward, unit or institution. According to the OSSIE guide, three broad principles should inform a standardised process for handover: staff should know the purpose of the handover; staff should know the information that they are required to communicate at handover; and staff should be aware of the documentation necessary to hand over (Australian Commission on Safety and Quality in Healthcare, 2010b). The SA Health Clinical Handover Guideline (2013a) recommends that clinical leaders should determine the context-specific minimum dataset or information to be handed over. The WA Health handover policy states that staff should be aware that the purpose is to hand over responsibility and not just information (Department of Health (Western Australia), 2013). The National Institute for Health and Care Excellence (NICE) Clinical Guideline No. 50 (2007) states that when a hospitalised patient with an acute illness is being transferred from the critical care unit to general ward both the transferring and receiving team take shared responsibility and should ensure that continuity of care is maintained by using a formal structured handover supported by a written plan.

The use of handover tools to support and augment clinical handover is widely advocated. For example, both the Joint Commission (2013) and Kaiser Permanente (2014) support the use of SBAR during professional communications. Guidance from Australia recommends the use of the ISBAR tool (Australian Commission on Safety and Quality in Healthcare, 2010, NSW Department of Health, 2010) or ISoBAR tool (Department of Health (Western Australia), 2013) to structure communications and further suggests that the ISBAR is compatible with the IMIST AMBO tool (Identification-Mechanism/Medical Complaint-Injuries/Information relating to complaint-Signs-Treatment and Trends-Allergies-Medications-Background history-Other information), the tool used for handover communication between ambulance personnel and emergency department (ED) staff (Iedema and Ball, 2010).

In Ireland, three tools have been recommended for use in specific contexts. The ISBAR communication tool has been included as part of COMPASS©/NEWS education programme, the education toolkit was developed under the Health Service Executive (HSE) National Acute Medicine Programme and forms part of the National Clinical Guideline N.1 – the National Early Warning Scores (National Clinical Effectiveness Committee, 2013) and Clinical Guidelines on Irish Maternity Early Warning System (I-MEWS) (Institute of Obstetricians and Gynaecologists,

2013). The ISBAR tool is also recommended in the guidelines for care of critically ill woman in obstetrics, developed by the Obstetrics and Gynaecology, Anaesthetic and Critical Programmes Clinical Strategy and Programmes Division (Health Service Executive, 2014). Two additional communication tools, the ASHICE (Age-Sex, History-Injuries/Illness-Condition-ETA) and the IMIST AMBO, are also components of the Draft recommendations for handover and handback for consultants, developed by the HSE Patient Safety and Quality Division (HSE, 2014) propose the use of a modified SBAR, namely Situation-Background-Assessment-Response, in the care of acutely ill patients. These recommendations indicate that each hospital should develop its own handover policy, involving a co-ordinated approach from hospital managers, doctors, and all the members of the multidisciplinary team (HSE, 2013). The recommendations further set out a draft framework for the development of the policy, specifying that it should ensure 'clear and effective' handover at the beginning and end of each shift, include consultant-led handover, with handover taking place at a 'dedicated time' and co-ordinated with shifts. In addition, new staff and locums should also be included in the handover, and the SBAR tool should be adopted and customised for use, through a process of communication with patients, carers, clinical staff, and nurses.

4.5.6 Handover in maternity services

The search of literature identified five publications, which referred specifically to handover in maternity care, as follows:

* *Good practice No. 12: Improving patient handover* (Royal College of Obstetricians and Gynaecologists, 2010),
* *Committee Opinion Number 517.Communication Strategies for Patient Handoffs* (American College of Obstetricians and Gynecologists, 2012),
* *Transfer Guidelines* (New Zealand College of Midwives, 2008), *Standards in Maternity Care in Australia and New Zealand* (Royal Australian and New Zealand College of Obstetricians and Gynaecologists, 2011),
* *Standards for Maternity Care: Report of a Working Party* (Royal College of Obstetricians and Gynaecologists, 2008).

The reports from both the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) (2011) and the RCOG (2008) indicate the need for 'personal handover' to be carried out on the labour ward during medical and nursing shift change. Additionally, regarding on-call consultants, the RCOG (2009) states that there must be a mechanism for formal handover between consultants following a period of on-call. The New Zealand College of Midwives (2008) transfer guidelines outline how the woman, whether pregnant, in labour or in the intra-partum period, should be handed over between the lead maternity carer (LMC), the midwife and other obstetric services, or between midwifery care from a LMC midwife to a core midwife, noting that this may be a 'a negotiated process'. The guidelines also specify the responsibilities for each of the obstetric services and the LMC with respect to the handover process.

The American College of Obstetrics and Gynaecologists (ACOG) guidelines suggest that the development of any standardised protocol or checklist for use to improve communication in maternity care should be a collaborative process led by obstetrician-gynaecologists (ACOG 2012). The RCOG (2010) guidelines are more specific, recommending the SBAR tool to structure clinical handover within teams and the use of the SHARING (Staff -High risk-Awaiting theatre-Recovery ward-Inductions-NICU-Gynaecology) proforma to standardise handover between teams. However, as Chin *et al.* (2010) report, the process of obstetric/midwifery shift handovers may be variable across settings and suggest that this variability must be taken into consideration when developing strategies to improve communication in this setting.

Table 4 Summary of recommendations on handover policy, process, and content, from sourced guidance

Recommendation	Context
Organisational policies	
Regularly review handover processes	Multiple handover scenarios
Review handover processes in collaboration with clinicians, patients and carers	Multiple handover scenarios
Implement monitoring and evaluation of handover	Multiple handover scenarios
The handover process should be monitored, evaluated and reported on to a recognised clinical governance body	Multiple handover scenarios
Ensure systems in place to make sure that effective and consistent agreed processes for handover are applied	Multiple handover scenarios
Report and investigate any handover incidents	Multiple handover scenarios
Identify high risk handover scenarios and monitor effectiveness of process	Multiple handover scenarios
Provide an adequate environment for handover	Shift handover
Plan overlapping shifts	Shift handover
Make information readily available i.e. reliable IT infrastructure	Multiple handover scenarios
Formalise attendance at handover	Shift handover
Highlight the value and importance of handover	Multiple handover scenarios
All staff must receive education on the site/service handover protocol	Multiple handover scenarios
Training should be included as part of staff orientation	Multiple handover scenarios
State and site specific handover requirements should be observed and taught to junior staff before they are required to lead or initiate handovers	Shift handover
Handover process	
Allow sufficient 'protected' time	Shift handover
Set an agreed time for handover	Multiple handover scenarios
Each area/service should identify which staff members are required to be involved in handovers	Multiple handover scenarios
Inter-professional (multidisciplinary) handover should be implemented wherever practicable	Shift handover
The key handover to or from the night team should be multidisciplinary	Shift handover
Attendance at handover to take precedence over all other work except emergencies, and all staff should attend handover where possible	Shift handover
Close to areas of work which are most used	Shift handover
Conduct in an area free from interruptions/distractions	Shift handover
Conduct in an area with access to information	Shift handover
When handing over patients, professionals should have access to all necessary clinical information about that patient	Shift handover
Conduct in an area where patient confidentiality and privacy can be maintained	ambulance to ED
Use a prepared handover sheet	Multiple handover scenarios
Use verbal, and face-to-face, communication for handover, where possible	Multiple handover scenarios
Use a written pro forma, complemented by face-to-face, verbal handover	Multiple handover scenarios
All handovers must be supported by current, appropriate documentation	Multiple handover scenarios
Handover of patients of concern and newly admitted patient at a minimum must be documented.	Shift handover

A minimum dataset or information to be included in clinical handover should be determined as by the clinical leaders	Multiple handover scenarios
Use a predefined format for handover content	Shift handover
Make staff aware of the documentation necessary to hand over	Multiple handover scenarios
Facilitate team discussion avoiding concurrent conversations i.e., one speaker at a time	Multiple handover scenarios
Acknowledge handover as two way process i.e. create opportunity for questions by receiving staff	Multiple handover scenarios
Facilitate participation and contribution by junior staff members	Shift handover
Nominate a leader to manage discussions	Shift handover
The most senior clinician available should lead the handover process	Multiple handover scenarios
Ensure adequate supervision by senior member of staff	Shift handover
Clarify roles and responsibilities of staff members during handover	Multiple handover scenarios
Clarify contact details for responsible physician	Shift handover
Clarify the plan for the shift	Shift handover
Ensure staff are aware of the purpose of the handover	Multiple handover scenarios
Ensure that staff members understand that handover is a transfer, not just of information, but of clinical accountability and responsibility.	Multiple handover scenarios
Clarify what is expected of staff during shift	Shift handover
Use 'read back' to ensure a common understanding	Multiple handover scenarios
Promote handover as a educational exercise	Shift handover
Conduct handover between different staff grades	Shift handover
Acknowledge the diversity of staff member i.e. that English may not be their first language	Multiple handover scenarios
Incorporate flexibility into the process to accommodate local, contextual demands	Multiple handover scenarios
Use a formal, structured handover of care supported by written plan	Critical care to general ward
Where practicable, handover should be conducted in presence of patient or carer	Multiple handover scenarios
Where practicable, patient (and/or carer) should be invited to be involved in the handover	Multiple handover scenarios
Handover content	
Use a consistent structure and content	Multiple handover scenarios
Limit the use of subjective, jargon and unapproved abbreviations	Multiple handover scenarios
Hand over concise, essential, relevant information	Multiple handover scenarios
Make staff aware of the relevant information to communicate	Multiple handover scenarios
Provide written guidelines for handover content	Multiple handover scenarios
Include operational matters i.e. bed availability	Shift handover
Recommended tools	
SBAR	Multiple handover scenarios
SHARING	Handover between teams
ISoBAR	Multiple handover scenarios
ISBAR	Multiple handover scenarios
ISBAR with IMIST AMBO	Ambulance to ED
IMIST AMBO	Ambulance to ED
ASHICE	Ambulance to ED

4.6 Common approaches to standardising communication

In recent years there has been a substantial increase in research examining handover communications (Kalkman, 2010). Improvement efforts typically strive to standardise the process, based on the growing consensus that it is the combination of a lack of systematic approaches to handover communication and the lack of staff training in clinical handover, which impede efforts to deliver high quality and safe patient care (Arora *et al.* 2005; Arora and Johnson, 2006;Sharit *et al.* 2008, Manser, 2011). However, Patterson (cited in Pillow, 2007) suggests that when developing customised handover communication processes, several key trade-offs exist, with the need to achieve a balance between the following: standardisation and flexibility; efficiency and effectiveness, since the information handed over cannot be exhaustive; staff availability to provide an update and familiarity with the patient; short-term and long term information needs; and direct and indirect audience. On the latter point, Patterson suggests that there may also be benefits associated with other staff members hearing the updates, in that they may receive other contextual information to mitigate error.

(Leonard *et al.* (2004) and Brindley and Reynolds (2011) suggest that the main strategies to improve communication can be broadly grouped as follows:

1) Strategies which improve verbal communication, i.e. encouraging the verbalisation of what one is about to do
2) Strategies which improve assertiveness, i.e. encouraging staff to assert their opinions or recommendations in relation to the patient
3) Strategies which improve understanding, i.e. using a common, critical language which all members of the team recognise and can respond to
4) Strategies which improve task completion, i.e. incorporating read back and closing the communication loop.

Standardising communication within healthcare provides a common language for clinical teams and can potentially overcome recognised flaws in communication processes, namely: the 'egocentric heuristic', whereby the sender assumes that the receiver has the same knowledge that s/he possesses, and 'diagnosis momentum', whereby the receiver simply accepts the information which has been communicated and fails to critically analyse it (Riesenberg, 2012). Standardising the process also provides a clear format for communication. As Leonard *et al.* (2004) suggest, using a common language 'creates predictability and agreement' in how staff members communicate with one another. The function, process, content, timing and the included staff members may be all predefined in a standard operating procedure for communication. Therefore, if no information is provided on a given element or topic of the exchange, the receiver can safely assume there is nothing of relevance to communicate; accordingly, an omission is not an oversight (Patterson, 2008). Moreover, creating a common format and structure for communication allows a 'shared mental model' or shared understanding of the situation, task and resources to be established between members of a clinical team (Brindley and Reynolds, 2011) and the team has a shared understanding of what is required in a given clinical situation and what is expected of them (Manser, 2011).

While a standardised approach to handover is widely advocated, several authors caution against adopting an overly standardised approach to communication, and it has been suggested that some degree of flexibility must be incorporated, both at the level of the communication process itself, to allow for prioritisation of information (Perry *et al.* 2008; Riesenberg, 2012), and at an organisational level, to accommodate differing contexts in which the process occurs (Australian Commission on Safety and Quality in Healthcare, 2010; Cohen and Hilligoss, 2010). On the latter point, Cohen and Hilligoss (2010) suggest that high-level recommendations to standardise handover often do not specify whether handover communication processes should ideally be standardised across the hospital – a challenge in itself, given the highly differentiated transfers of care which occur – or whether each unit or ward should standardise its own processes

in accordance with local needs. While standardising at the unit level is more feasible and is advocated by the Australian Commission on Safety and Quality in Healthcare (2010), Cohen and Hilligoss (2010) caution that there may be additional complexity when standardising communications between different unit teams who may have very different expectations and work processes. They also suggest that while standardisation has the potential to improve the quality of information exchanged during handover communications, the effect of standardisation on the other purposes of handover, the 'trade off', is unknown (Cohen and Hilligoss, 2010). Some authors have expressed concern that by creating too rigid a structure for communications, the potential for other, more informal, exchanges of information may be limited (Cheung *et al.* 2010; Cohen and Hilligoss, 2010). Abraham *et al*. (2011) suggests that currently proposed tools to improve handover may be limited if they are too 'structured and exhaustive' or, conversely, too open-ended.

Common approaches to standardisation can be classified as: content standardisation (e.g. checklists, standardised forms); topic standardisation (e.g. high-ordering mnemonics); or performance standardisation (e.g. the clinical team develops a local needs-driven protocol locally) (Cohen and Hilligoss, 2009; Cheung *et al.* 2010; Manser and Foster, 2011). Content standardisation and topic standardisation are the methods most frequently used in practice.

4.6.1 Content standardisation

Content standardisation involves defining the information content to be transferred or exchanged during handover, followed by implementation of a form or a checklist appropriate to that clinical setting (Manser and Foster, 2011). Content standardisation tools are therefore typically tailored to a specific handover scenario, which make it difficult to judge their applicability in alternate settings.

4.6.2 Topic standardisation

Topic standardisation, which structures communication by broad information categories rather than specifying data elements to be exchanged (Manser and Foster, 2011), may be easier to generalise to broader multiple clinical settings. Commonly, mnemonics, such as SBAR and ISBAR, are used to aid recall of these information categories. For example, in the most commonly-cited mnemonic, SBAR, each letter in the mnemonic represents a broad step to be carried out during handover (Riesenberg *et al.* 2009). A common approach is to use SBAR as the basic tool and adapt it for local circumstances thereby generating a new mnemonic. For example two National Health Service (NHS) Trusts in the UK (Ottewill *et al.* 2007) jointly adapted SBAR for use on maternity wards, creating the mnemonic CHAPS (Annex 3 in the literature section), which suggests labour-specific information to be transferred. The mnemonic CHAPS refers to: Clinical Picture (parity, gestation, spontaneous/induced labour, reason for admission), History (obstetric, medical, social, including child protection/language barriers), Assessment (progress of labour, pain relief, syntocinon, cardiotocograph, any medication, observations/bloods/fluid balance, low or high risk), Plan (current plan of care, client discussion about plan, is the plan documented?) and Sharing information (status of the unit, staffing, changes in practice/ways of working, theme of the week).

Numerous other mnemonics exist and are summarised in Annex 5 (in the literature section). However, Cohen and Hilligoss (2010) suggest that mnemonics may be less appropriate for between-unit handovers, since they typically assume a one-way transfer of information and may not fit well with the complex negotiations that can occur during between-unit handoffs. Eggins and Slade (2012) similarly caution that mnemonics like ISBAR may be limited, since they specify only the contribution of the person who is giving the handover and do not incorporate contributions from the person receiving the handover, and because they focuses solely on the informational content and do not indicate how the conversation should be conducted. Pillow

(2007) suggests that SBAR may work effectively for rapid-response calls, but not so well for shift handover or sign-out, as it does not accommodate medical history and hospital course, review of every active problem or a management plan.

4.6.3 Performance standardisation

Performance standardisation can involve a 'ground up' approach to improving handover communication, involving the development of multifaceted protocols which can include, but are not limited to, a change in the location of the handover to a quieter area, dictating the presence of senior personnel at handover, coupling verbal handover with standardised written documentation, or altering the team structure and conduct of handover, that is, changing from multi- to uni-disciplinary handovers or vice versa (Cheung *et al.* 2010). Performance standardisation is a tailored approach to handover improvement, which may limit its applicability in alternate settings. However, according to Edozien (2011), efforts to improve handover protocols between clinical teams should broadly aim to improve each of the following core elements: leadership, situational awareness – efficient in anticipating problems and being constantly aware of what is happening on the unit – mutual support between professionals and communication, to ensure it is complete, clear, timely, and brief.

4.6.4 IT and technological solutions

In the way that it can act as a reminder and facilitate information transfer, workflows and the effective distribution of information, information technology (IT) plays an active and passive role in both communications and patient safety (Laxmisan *et al.* 2007). The utilisation of electronic tools to standardise and support handover may entail integration with centralised electronic medical records (EMR) systems, which offer the potential to harness the stored information, auto-populate standardised forms, theoretically increasing the accuracy of information transfer and the efficiency of the handover process (Department of Health (UK), 2005; Joint Commission, 2006; Flemming and Hubner, 2013). Electronic approaches may support the inclusion of minimum data sets, incorporating predefined fields, prompts for data entry, and drop down menus (Thomas *et al.* 2009).

Based on the findings from three case studies of clinical information system utilisation (Thompson *et al.* 2009), guidance provided by the ACSQHC on the safe use of electronic tools (Thomas *et al.* 2009) warns that these tools should serve to *support* handover, and should not aim to replace good handover practice, including face-to-face communications and discussion between professionals. Moreover, these tools have the potential to create, rather than mitigate, errors if inadequately designed or inappropriately utilised, and careful consideration must be given to how they will operate within a given clinical setting, and whether features of that setting are conducive to their use. Their effective use assumes that clearly-defined workflows and processes are already in place in relation to handover. IT systems may interrupt clinicians' workflows by requiring them to log in, enter passwords and look up relevant information, potentially making the process more inefficient and distracting them from patient care (Bomba and Prakash, 2005). In this regard, the ACSQHC recommends that electronic solutions should be developed using a 'bottom up' approach, which incorporates staff input and responds to local need, therefore ensuring compatibility with existing systems and processes (Thomas *et al.* 2009).

The ACSQHC further recommends that special consideration be given to how transfer of responsibility for patient care can be supported, for example by electronic signatures, and how the accuracy and relevance of information within the system can be achieved. The (Irish) National Health Information Strategy (Department of Health and Children, 2004) and the National eHealth Strategy (Department of Health, 2013) have recognised that the integration of health systems and processes through information technology is a key step towards enhancing the delivery of healthcare services. However, as highlighted by the HIQA in its Healthcare

Interoperability Standards (HIQA, 2011), the ICT infrastructure in Ireland is still largely inadequate and information exchange between providers is limited, such that it can often be difficult to safely communicate clinical information. As such, the development of electronic tools to support handover communications will need to be supported at a national level by policies to improve the existing ICT infrastructure and enhance the *interoperability* of EHRs.

4.7 Communication processes and their impact on patient outcomes

A greater focus on examining patient safety incidents has led to a better understanding of the factors, which may cause or contribute to patient harm. Reason classifies failures as active or latent, the former a result of 'unsafe acts' and poor decisions, the latter arising from inadequate system design. Latent failures, which occur at a wider organisational level, may include detrimental work conditions, high workload, inadequate staff knowledge or ability, and poor communication processes (Department of Health (UK), 2000). Derived from this Reason's model, Vincent's framework for the analysis of incidents in medicine identifies core causal factors associated with medical error (Vincent *et al.* 1998), one of which is team factors and has several components: verbal communication, written communication, supervision, seeking help, and team leadership. However, as Ye and colleagues (2007) suggest, current understanding of how *specific* aspects of the handover communication process impact on patient safety is limited. The link between communication failures and patient outcomes has been largely established by retrospective analyses, which do not always fully delineate how poor communication operates to cause harm.

4.7.1 Retrospective analyses of patient safety incidents

The literature search identified a number of retrospective studies, which analysed malpractice claims or incident reports, and reported that communication failures may play a contributory role in adverse patient events across a variety of clinical specialities (Beckmann *et al.* 2004; White *et al.* 2005;Greenberg *et al.* 2007; Kachalia *et al.* 2007; Singh *et al.* 2007; Bongaerts *et al.* 2012; Pezzolesi *et al.* 2010; Rabol *et al.* 2011).

In an analysis of malpractice claims in which medical trainees played an important causal role, Singh *et al.* (2007) suggest that clinical handover problems may be more prevalent as a contributory factor among incidents that involve trainees, than those which involve experienced clinicians. Conducted by White *et al.* (2005), a retrospective analysis of obstetric- and gynaecology-related internal review files found that communication failures were associated with 31 per cent of adverse events and that, in some cases, these failures exacerbated treatment or diagnosis errors. Greenberg *et al.* (2007), who examined malpractice claims involving surgical care, determined that communication breakdowns were detected in nearly a quarter (60 of the 258) of all claims reviewed and that the majority of breakdowns occurred during verbal communications. In most cases the breakdowns occurred during communications between just two professionals, rather than in the context of group communications, and arose from the fact that information was never transmitted, or because it was inaccurately received. Kachalia *et al*. (2007) reviewed malpractice claims to identify the types and causes of delayed diagnoses in the ED and found that inadequate handoffs were among the leading contributors to cases of missed diagnosis, being a contributory factor in approximately a quarter of cases. From an exploratory review of Root Cause Analysis Reports across six Danish hospitals, Rabol *et al*. (2011) determined that incidents often occurred in cases where communication was not governed by a procedure or protocol, and communication was particularly vulnerable when transferring patients between departments or hospitals. A retrospective malpractice case analysis reported by Bongaerts *et al*. (2012) indicated that communication breakdowns were among the leading system factors in cases of anesthesiological errors. From an analysis of handover incidents abstracted from a voluntary incident reporting system at a UK hospital, Pezzolesi *et al*. (2010) found that the majority of incidents occurred at shift handover. From a review of incidents in the Radiology Events Register, Hannaford *et al.* (2013) found that the handover of clinical information to and from the medical

imaging department frequently involved error, associated with delayed communication of a diagnosis or communication of a wrong diagnosis.

While the various studies cited highlight the role of communication in patient adverse incidents, as retrospective studies they may be limited by hindsight and recall bias. Moreover the results depend on the accuracy of the filed reports used as data and cannot account for other contributing factors, such as staff fatigue, which may not have been documented in the files. While the findings from malpractice claims analyses may not be generalisable to other less severe incidents, such as non-severe injury or non-litigated incidents, Singh *et al.* (2007) argue that the underlying causes for most errors may be the same.

Other retrospective studies have indicated the role of poor communication in incidents of potential patient harm. In a study among internal medicine residents at a US hospital, Arora *et al*. (2007) highlighted the frequency of medication errors that accrued during shift handover and their potential to result in patient harm. Based on a comparison of patients' charts with written sign-out notes and using daily medication lists as a 'gold standard', Arora *et al*. (2007) found that the majority of daily sign-outs contained at least one omission error and over one third contained at least one commission error. They concluded that over half of all discrepancies have the potential to cause significant harm to patients. Jones *et al.* (2011) retrospectively reviewed a cohort of patients who were transferred from the emergency department (ED) to an acute stroke unit and found that patients present in the ED during a shift change, after adjusting for length of time in ED, had five times the rate of pneumonia as that in the non-shift change group.

Communication failures are just one of several factors which contribute to medical errors and patient incidents, as Beckmann *et al*. (2004) highlighted in an analysis of intra-hospital transfer incidents reported to a voluntary incident reporting system. Of the 191 incidents relevant to intra-hospital transfer, communication and liaison issues formed just one element of several patient and staff management problems adjudged to impact on patients. Communication processes are themselves facilitated or impeded by the wider context in which they occur, including aspects of management and organisation and features of the immediate environment. The interaction of these factors further complicates attempts to delineate how poor communication affects patient safety.

4.7.2 Prospective observations of the role of communication in patient safety

Several studies were identified which examined whether discontinuity of care or errors occurring during handover communication impacted negatively on patient outcomes (Lingard *et al.* 2004; Arora *et al.* 2007; Williams *et al.* 2007; Ye *et al.* 2007; Horwitz *et al.* 2008; Redfern *et al.* 2009; Ong and Coiera, 2010). Most of the studies examined communication events using observation (Hu *et al.* 2012; Horwitz *et al.* 2008; Lingard *et al.* 2004; Ye *et al.* (2007) and some employed complementary interviews (Horwitz *et al.* 2008; Ye *et al.* 2007) or interviews alone (Stiell *et al.* 2003). From the studies reviewed, a number of authors have proposed classification systems for communication event failures. Lingard *et al*. (2004) identified communication event failures as 'occasion' failures, whereby the timing of the communication event is issued or requested too late to be of maximal use, and 'content' failures, in which relevant information is omitted or inaccurate information provided. Hu *et al.* (2012) classified communications failures as either 'audience' failures, whereby a key individual is excluded from the conversation, and 'purpose' failures, where an issue discussed is unresolved. Williams *et al*. (2007) used a simple typology of 'improved', 'not improved' or 'worsened' communication.

Based on observations and follow-up interviews with internal medicine residents, Horwitz *et al*. (2008) identified deficiencies in handover communication, including: omission of the current clinical condition, overlooking abnormal test results, communicating insufficient planning details, failing to provide rationales for to-do tasks, and omission of anticipatory guidance. These deficiencies could result in negative downstream impacts for the oncoming physician in terms of prioritising or

identifying clinical deterioration and prioritising tasks. Lingard *et al*. (2004) observed, recorded and classified all communication events occurring during surgical procedures at a Canadian hospital and identified 'occasion' and 'content' communication failures as the most common. Although more than one third of the observed communication failures had visible effects on the *system* processes by causing inefficiency, team tension, resource waste, delays, patient inconvenience and procedural error, the failures were not linked to patient harm or adverse events (Lingard *et al*. 2004). Hu *et al.* (2012) conducted observations of communications in the operating room (OR) of a US hospital and found that the majority of failures arose from failure to include a key individual ('audience' failure) or failure to resolve an issue ('purpose' failure). A small-scale study conducted by Williams *et al*. (2007) examined the association between communications in the surgical ICU and short-term patient outcomes and found that, while causality could not be established, communication of prospectively-defined patient events was the single, significant predictor of improvement in short-term patient outcomes.

Three studies reviewed failed to establish a link between communication problems and adverse patient outcomes (Petersen *et al.* 1994; Stiell *et al.* 2003; Ye *et al.* 2007). In an Australian study conducted among ED staff, Ye *et al.* (2007) examined the association between handover quality and adverse events. The authors reported that, while there was an association between completeness of information and handover quality, no patient was found to experience an adverse event as a result of insufficient information. Using a case control design, Petersen *et al*. (1994) examined the relationship between coverage schedules and the occurrence of preventable adverse events and found that patients who had potentially preventable adverse events were more than twice as likely to be the responsibility of either an intern from another team or a 'night-float' resident, as compared to matched controls in adjacent beds. However, the authors conceded that a clear association could not be established since severity of patient illness, acting as an independent correlate of preventable events, could explain the adverse preventable events. Stiell *et al*. (2003) interviewed the attending physicians of a non-random sample of patients who presented at the ED and identified an information gap in the form of physicians' limited access to needed patient information, which had been previously collected. The authors were unable to establish a link between information gaps and the likelihood of admission to hospital, and while information gaps were associated with prolonged stays in the ED, severity of illness may have distorted the observed relationship. Conducted among multidisciplinary surgical staff across 52 sites, Davenport *et al*. (2007) examined the association between staff perceptions and objective patient outcomes. Using the Safety Attitudes Questionnaire (SAQ) and assessing adjusted 30-day morbidity and mortality for a 12-month period, they found that reported levels of positive communication and collaboration among attending and resident doctors correlated with a lower risk-adjusted morbidity, although this effect was not substantial for nurses or other health-care providers.

Examining the relationship between poor handover communication and adverse patient events carries inherent limitations. These include use of a single observer and reliance on subjective ratings of handover quality (Ye *et al*. 2007), the timing of physician research interviews (Stiell *et al*. 2003) and the presence of confounding variables like severity of patient illness (Stiell *et al.* 2003; Petersen *et al*. 1994).

4.7.3 Process mapping and fault analysis

Two studies were identified, which mapped patient pathways in order to determine whether communication events were vulnerable points in the process of care. One Australian study reported by Ong and Coiera (2010) examined inpatient transfers to radiology using fault tree analysis and reliability analysis, approaches that, respectively, examine the causal chain of an error and the probability that a task will be accomplished successfully within a specified minimum time. In determining the role of handover in specific patient outcomes, they reported that where the transfer process led to inadequate infection control, this was most probably the result of a failure at the verbal handover and least probably the result of failure at the written handover

(Ong and Coiera, 2010). While this finding suggests that verbal handover is vulnerable to error, the process was studied at a single site using a convenience sample of transfers and may not be representative of the patient pathway and not be applicable to other settings. A UK process mapping study reported by Redfern *et al*. (2009) examined vulnerabilities in patient pathways in the ED using a combination of clinical expertise and observational data, and identified failure modes by conducting interviews with ED staff of varying degrees of seniority and expertise, to assess the probability and severity of each failure mode. Using this hazard assessment approach, the authors identified at least one failure mode for each of 21 communication steps in the patient care pathway, with each mode judged to have a high frequency of occurrence and moderate to minor effect on the patient.

4.7.4 Staff perceptions on communication and patient safety

The majority of studies of handover communication have retrospectively examined staff perceptions on the role of communication processes in patient safety (Jagsi *et al*. 2005; Sabir *et al.* 2006; McCann *et al.* 2007; Kitch *et al.* 2008; Sharit *et al.* 2008; Hinami *et al.* 2009, Horwitz *et al.* 2009; McSweeney *et al.* 2011;Sutcliffe *et al*. 2004). These studies indicate that healthcare professionals frequently believe that omissions and errors in the information communicated at handover may have impacted negatively on patient outcomes, although the extent to which communications are judged to play a part in patient harm varies; this is unsurprising given the range of clinical disciplines and settings represented in the various studies. Based on interviews with nurses and physicians to evaluate the impact of shift handover at two critical care units at a single site, Sharit *et al*. (2008) reported that omissions were often cited as the source of flaws in patient care, along with ambiguity of communication, specifically, incorrect interpretation of a communicated message. Jagsi *et al*. (2005) examined adverse events using a survey of 379 medical residents in the US and found that while almost a quarter (22.6%) believed that the event was caused by a mistake, just 3 per cent believed that problems with handoffs had contributed. In a national survey among lead consultant obstetric anaesthetists in the UK and concerning critical incidents associated with handovers in the previous 12 months, Sabir *et al*. (2006) found that just four per cent of the critical incidents were reported as having occurred as a result of poor obstetric anaesthetic handover

In contrast, a number of studies have reported practitioners' perceptions of an association between the quality of handover communication and adverse patient outcomes. In a survey of surgical and general medical residents at a US hospital, Kitch *et al*. (2008) found that over half of the residents believed that at least one patient had experienced minor harm during their most recent rotation as a result of problems with handoff, and in a survey among nurses and senior house officers at a New Zealand hospital, McCann *et al*. (2007) found that all but one respondent reported they had experienced a clinical problem directly related to a poor handover at least once over a three-month rotation. Based on a study among residents from multiple specialties at a US hospital, Sutcliffe *et al.* (2004) found that the most frequently-reported 'medical mishaps', ranging from near-misses to serious errors, were the result of patient management errors, commission, omission, diagnosis and treatment errors, and that communication failures were seen as an associated or contributory factor in 91 per cent of reported medical mishaps. A survey of ED and inpatient staff members reported by Horwitz *et al*. (2009a) found that just over a quarter of respondents reported that a patient in their care had experienced an adverse event as a result of inadequate communication between the ED and the admitting physician, and a failure to communicate vital signs was cited in 28 per cent of all incidents reported. However, Philibert *et al*. (2009) found that residents working in internal medicine, paediatrics and obstetrics and gynaecology believe that, while errors and omissions occurred during handover, these errors rarely caused harm to the patient, since they were often 'caught' by other parties involved in the patient care process.

The studies reported above, which elicited staff perspectives on the relationship between handover and adverse events, relied on the accuracy of respondent recall and respondents'

subjective judgement on whether handover played a part in patient harm. These limitations notwithstanding, the findings from these studies indicate that healthcare professionals are aware of and understand the risks inherent in communication processes, and this fact may facilitate and drive communication and efforts to improve handover.

4.8 Barriers and enablers of communication

The effectiveness of handover reports and other communication processes in secondary and tertiary care is, in much part, determined by factors internal and external to the actual communication event. Some factors act as enablers to effective communication, while others act as barriers. The barriers reside in the organisation and are a function of context, culture, inter-professional relationships and the actual quality of the communication. Among the enablers are improved quality of information content, the use of a common language and a structured way of communicating information.

4.8.1 Barriers

Organisational context and infrastructure

Lawrence *et al*. (2008) write that handover is 'critically embedded in a process and a context', suggesting that wider organisational factors have the potential to impact on the effectiveness of this exchange. However, Siemsen *et al*. (2012) point out that studies which identify barriers to handover communication often neglect to consider factors operating at the level of the organisation, including the culture and the infrastructure. Healthcare professionals surveyed on the subject of clinical handover have reported barriers to effective handover; reported barriers include a lack of organisational support structures and a lack of a formal policy for clinical handover (Siemsen *et al.* 2012; Health Foundation, 2011), including a failure to schedule adequate overlap time between shifts (Health Foundation, 2011) and a lack of education and training in handover communication (Health Foundation, 2011; Horwitz *et al*. 2006). Additionally, based on a survey of anaesthesia staff, Wright *et al*. (2013) found that clinical staff may be reluctant to comply with a standardised communication process, unless the process was made a standard of care.

The lack of a reliable IT infrastructure within healthcare organisations can also limit the accessibility of information, making it difficult for staff to source updated and accurate data on their patients. A number of studies indicated the importance of readily available information to achieve effective inter- and intra-professional communications (Wilson. *et al.* 2005; Astrom. *et al.* 2007; Grobman *et al.* 2011; Health Foundation, 2011; Siemsen *et al.* 2012). Siemsen *et al.* (2012) found that health professionals had concerns about the quality of infrastructure to support effective handover; these included incompatible and often inaccessible IT systems to support the handover process and poor record keeping and documentation within organisations, such that elements of information contained in the electronic medical record (EMR) were missing, unavailable or not up to date. Grobman *et al*. (2011) reported difficulties experienced by multi-disciplinary professionals working on maternity units in accessing sources of patient information and the relevant personnel to supply the information. In a study of paediatric ward shift handovers, Wilson *et al.* (2005) noted that the information contained in the forms used during handover, while informative and well structured, was not always reliably entered into the EMR.

Environmental context

The immediate environment in which communications occur can impede the quality of the information exchange. Ineffective communications may result from and may also exacerbate system failures in the clinical setting (Apker *et al.* 2007) and certain information exchanges may be more vulnerable to the context in which they happen; the transfer of care from the ED to the inpatient ward is reported as a particularly high-risk in relation to effective communication

exchange (Apker *et al.* 2007, Horwitz *et al.* 2009). Apker *et al.* (2007) suggest that there is insufficient research that explores the communication characteristics of handover to determine the *specific* environmental barriers in specific clinical specialities. However, a number of environmental factors have been reported, which appear prevalent across several different settings.

Frequent interruptions during communication processes are widely reported (Coiera and Tombs, 1998; Lawrence *et al.* 2008; Sharit *et al.* 2008; Welsh *et al.* 2010; Aase *et al.* 2011, McSweeney *et al.* 2011; Bost *et al.* 2012; Poot *et al.* 2013). Interruptions are associated with distractions arising from staff movement in an out of the area where communication happens (Smith *et al.* 2008) and staff attending to other tasks simultaneously, limiting their focus on the information exchange at hand (Jenkin *et al.* 2007; McFetridge *et al.* 2007; Sharit *et al.* 2008; Smith *et al.* 2008; Bost *et al.* 2012). Frequent interruptions affect short-term or 'working memory' which is particularly vulnerable to error (Alvarez and Coiera 2006). While, policies and protocols may stipulate the use of a quiet, distraction-free environment for handover communications, these protocols may be limited by the degree to which staff members follow them. An observational study by Chen *et al*. (2011) found that, despite the introduction of a new protocol between the OR and Cardiac Paediatric ICU, which specified that the area for handover should be free from nonessential activities in order to minimise interruptions, more than half the distractions observed were classified as non-essential.

Multitasking may also disrupt the communication process during patient transfers. ED and ICU nurses interviewed as part of a study by McFetridge *et al*. (2007) reported that communication handover was delayed during the ED to ICU handover due to the ICU nurse having to attend to other tasks prior to receiving the patient. Both Jenkin *et al*. (2007) and Owen *et al.* (2009) reported a similar impediment to effective communication between ambulance personnel and ED staff, with ambulance staff expressing frustration at the fact that the ED nurses were often unable to receive handover information as they were attending to other patients. With respect to OR to PACU transfer, Smith *et al*. (2008) observed that in some cases the anaesthetist had to wait until the recovery nurse became free before information could be handed over.

Heavy workloads combined with limited time in which to conduct communication handover can also affect the nature of the exchange. Philibert *et al.* (2009) showed that while verbal handovers predominated in internal medicine, with a preference for verbal, interactive handoffs, time constraints and dispersion of patients across the institution prevented handoffs from occurring. Others researchers have similarly reported that truncated or omitted information at handover is often the result of insufficient time, as in the case of handovers between ED and inpatient wards (Horwitz *et al.* 2009a) and between anaesthesiologists and PACU staff (Siddiqui *et al.* 2012). Another impediment to effective handover communication is fatigue among staff at the end of a duty shift (Sharit *et al.* 2008).

Workplace culture and professional relationships

The working environment within healthcare organisations may influence staff relationships and interactions (Solet *et al.* 2005; Grobman *et al.* 2011) and affect how professionals perceive the role of communication and clinical handover, consequently acting as a barrier to effective communication. Siemsen *et al.* (2012) reported that healthcare professionals believed that the existing culture within healthcare organisations did not emphasise the role of clinical handover in patient safety. As a result, staff did not recognise clinical handover as a high-risk activity and therefore did not prioritise it in their work. Beach *et al.* (2012) suggest that healthcare professionals may rely on the cultivation of trusting relationships with others, in order to lessen the complexity of patient care processes.

Apker *et al*. (2007) examined handovers between emergency medicine and internal medicine physicians and identified that one of the barriers to effective handover as 'relational communication barriers' related to power and status differences among physicians. In a multi-

method study among staff working in general medicine and EDs, Bomba and Prakash (2005) proposed that by cultivating a workplace culture, which can overcome professional boundaries, the communication of information, particularly between nurses and physicians, may be improved.

These relational barriers between professionals may potentially impede handover as a two-way process. Randell *et al*. (2012) observed verbal shift handover across three sites in the UK and reported that, in some cases, the individual receiving the handover would correct the information, based on their previous knowledge, thereby illustrating how the interactive nature of the exchange created opportunities to correct errors. A number of studies highlight the limited degree to which staff feel that they can question one another during communications. Greenstein *et al*. (2011) found that staff infrequently clarified information or asked questions during communication events. Using the Handoff Evaluation Assessing Receivers (HEAR) checklist, they reported a higher frequency of passive listening behaviours over active listening and found that most directly-asked questions were clarification of information, with just over a third related to anticipatory guidance. Apker *et al.* (2007) similarly observed that communications between EM and IM were dominated by information-giving rather than information-seeking activities, suggesting that information is not actively sought out or questioned. Welsh *et al*. (2010) also pointed to limited opportunities to ask questions during the clinical handover process as an impediment to effective handover communication.

Different professional groups may differ in their perceptions of and willingness to engage in handover communication as a two way process, and the quality of handovers can be influenced by level of experience and relative position within professional hierarchies. Lukens and Fragneto (2013) suggest that the hierarchies which exist on many maternity units may contribute to hesitancy when offering opinions or verifying information. Randell *et al*. (2012) found variability in the extent to which handover was a two way process; for example, nursing handovers did not display the same level of two way communication as physician handovers. Reader *et al*. (2007) demonstrated that in respect of the ICU setting, different professionals' perceptions on information seeking during handover communications may be influenced by their level of experience and their role as either sender or receiver of the information in the exchange. Paediatric critical care managers interviewed by Sharit *et al*. (2008) believed that inexperienced nurses may feel intimidated and unable to ask relevant questions during handover communication, and Carroll *et al*. (2012) found that less experienced nurses expressed concern that handover was too brief and that elements of information had been left out. From observing postoperative handovers at a UK hospital, Manser and Foster (2013) found that information seeking was more evident during trainee-to-consultant handovers. The quality of information exchange at handover is a function of how the handover process is perceived. For example, Carroll *et al.* (2012) found that outgoing and incoming nurses rated the quality of handover reports differently, with the former rating reports as more effective when fewer questions were asked by the incoming nurse. McCrory *et al*. (2011) also reported differing staff perceptions regarding the quality of handover communications associated with paediatric rapid response events.

Several studies have suggested that other features of existing relationships between professionals may influence the effectiveness of communication (Apker *et al.* 2007; McFetridge *et al.* 2007; Horwitz *et al.* 2009a; Bost *et al.* 2012; Siassakos. *et al.* 2013). In a study of ambulance to ED transfers at an Australian hospital, Bost *et al.* (2012) found that the amount of information transferred and the perceived reliability of the handover exchange appeared to depend on the relationship between the professionals involved, which was a function of the level of trust between them. Philibert *et al.* (2009) reported that medical residents may judge the value of the information handed off, based on prior clinical interactions with those with whom they are communicating and this was based on whether they knew and/or trusted one another. Carroll *et al.* (2012) found that nurses' judgement of handover quality may be affected by whether the relationship was positive or negative. Despite the fact that nurses rated the handoffs as quite high, when the authors rated the quality based solely on the information transfer, they found that only 26 per cent of active medical issues were represented accurately. As such, nurses' self-rating of handoff

seemed to be more associated with the presence of a positive relationship during the handover than the information content transferred.

A basic lack of familiarity and established relationships with other staff members may be a barrier to effective communication. Siemsen *et al.* (2012) found that not all health professionals in a large hospital will know each other or recognise the competencies of other team members and this can impact on communication and collaboration on the patient's treatment. Based on a review and synthesis of findings from seven UK studies that examined teamwork, leadership and team training among maternity teams, Siassakos *et al*. (2013) found that the ad hoc and transient nature of clinical teams was an impediment to good team performance. McFetridge *et al.* (2007) found that a barrier to effective communication during ED to ICU transfers was a lack of clarity and awareness on the part of nurses of each other's respective roles.

Unfamiliarity among team members may be compounded by differing expectations and perspectives between clinical departments regarding clinical handover. McFetridge *et al*. (2007) found that nurses had different perceptions as to the point at which handover from ED to ICU actually began. Apker *et al*. (2007) similarly reported differences in perspectives among emergency medicine and internal medicine physicians as to the function of the handover report; emergency medicine physicians used handover information to 'sell' the admission to inpatient staff at handover, whereas internal medicine physicians wanted information to be more complete at handover in order to understand the reason for admission. Horwitz *et al*. (2009a) also reported on the complex negotiations which may occur between staff members from ED and inpatient wards during the transition from emergency department to inpatient care. Interviewed by Owen *et al*. (2009), paramedics and ED staff at two Australian hospitals reported difficulty in establishing a 'shared cognitive picture' between them during handover.

Blurred lines of responsibility

The point of giving and taking responsibility for patients in clinical handover scenarios is often reported to be ambiguous, thereby impacting on the effectiveness of the exchange (Bomba and Prakash, 2005;Williams *et al*. 2007; Philibert *et al*. 2009; Bost *et al*. 2012; Chin *et al*. 2012; Wayne *et al*. 2008). Maternity staff interviewed as part of an Australian study believed that responsibility for the woman was not handed over completely at handover, and that it was particularly 'blurred' during periods of overlapping shifts (Chin *et al*. 2012). A survey of training programme directors of Accreditation Councils for Graduate Medical Education in the US (Sinha *et al.* 2007) found that while the majority believed that responsibility was transferred at shift handover, a sizable number believed it was rarely transferred. The point of transfer of responsibility can be problematic in the case of ED to in-patient transfer and ICU to ward transfer. In the case of the former, handover communication can be decoupled from physical transfer in circumstances in which the patient remains in ED due to bed shortages and this complicates the point of transfer of responsibility (Apker *et al.* 2007; Horwitz *et al.* 2009a). Li *et al*. (2011) reported a case where ambiguous transfer of responsibility during ICU to ward handovers resulted in two patients being transferred to the ward without the knowledge of the receiving physician, such that they were 'lost to medical care' for a period of 48 hours.

Differing understandings of responsibility between clinical departments can also impede the effectiveness of communication processes, particularly in relation to the follow up of test results. For example, Horwitz *et al.* (2009) reported that once emergency medicine physicians handed over a patient, they believed they no longer had responsibility for ensuring that ordered tests were completed and followed up. These issues of responsibility exchange may be further complicated by shift changes occurring concurrently on wards (Ong *et al*. 2011).
Smith *et al*. (2008) reported a lack of formal documentation to confirm that handover from OR to PACU had taken place, and observed that the transfer of responsibility did not always coincide with knowledge transfer and that communication of information did not always oblige

professionals to take responsibility. This suggests that transferring responsibility in a way that does not complicate or impede the communication process may need to be determined locally.

Information quality

The most frequently-reported impediment to effective communication is the failure to communicate and hand over clear, complete and accurate information (Bomba and Prakash, 2005; Apker *et al.* 2007; Lawrence *et al.* 2008; Smith *et al.* 2008; Siemsen *et al.* 2012). Several studies have reported that the information shared during handover lacks consistency and/or structure and that there is often no clear format or mechanism for transfer (Thakore and Morrison, 2001; Bomba and Prakash, 2005; McFetridge *et al.* 2007; Ye *et al.* 2007; Lawrence *et al.* 2008; Chen *et al.* 2011; Wright *et al.* 2011; Keenan *et al.* 2013; Roughton *et al.* 1996). This latter problem is often reported to be a result of the lack of local policies and systematic protocols in place to guide communication processes (Bomba and Prakash, 2005; Horwitz *et al.* 2006; Sabir *et al.* 2006; Budd *et al.* 2007). Beach *et al*. (2012) write that the ideal handover should contain the 'right quantity and quality of information in a timely manner – no more, no less'.

Randell *et al*. (2011) observed that staff needed to be able to select, from all the available information about the patient, that information which was relevant to hand over for the next shift. A number of studies have suggested that professionals often may find it difficult to discern what items are important to communicate (McFetridge *et al.* 2007; Philibert *et al*. 2009). In the absence of a defined protocol, practitioners may communicate certain types of information elements more frequently and more reliably than others (Thakore and Morrison, 2001; Carter *et al.* 2009; Evans *et al.* 2010; Bump *et al.* 2011; Maughan *et al.* 2011; Health Foundation, 2011; Ilan *et al.* 2012; Poot *et al.* 2013), make errors or omit of key information, items (Aylward. *et al.* 2011; Derienzo *et al.* 2014), or distort the original communication, what Owen *et al* (2009) refer to as the 'Chinese whispers' effect. Ilan *et al*. (2012) and Poot *et al*. (2013) observed communications among critical care physicians and maternity unit professionals, respectively, comparing the content communicated against existing mnemonic tools. They found that while the majority of communications contained background (Ilan *et al.* 2012; Poot *et al.* 2013) and subjective (Ilan *et al.* 2012) elements, limited communications were closed with recommendations (Ilan *et al.* 2012; Poot *et al.* 2013) or plan (Ilan *et al.* 2012) elements. Both study authors suggest that recommendations may not have been offered in the handover out of deference to the oncoming physician (Ilan *et al.* 2012; Poot *et al.* 2013) and Ilan *et al.* (2012) reported that the outgoing physician focused on conveying the patient's trajectory rather than listing what to do next. Goff *et al*. (2014), who audited multidisciplinary maternity staff compliance with ACOG criteria for shift handover, found that the use of S and B elements of SBAR was most frequent among nurses whereas the use of A and R elements was most frequent among medical residents.

Success in conveying relevant information may depend on the ability of staff to determine what information is pertinent to communicate (Philibert. *et al*. 2009) and the information transferred may be based on the professional judgement of the transferring clinician as to which information items to pass on (Wilson *et al.* 2005). Professional judgement is, in turn, partly a function of experience, which has been identified as a factor in handover quality (Horwitz *et al* 2009b; Apker *et al.* 2007; Poot *et al.* 2013; McFetridge *et al.* 2007). Horwitz *et al*. (2009b) found that senior staff are more likely than junior staff to communicate more complex information and anticipatory guidance at sign-out. Apker *et al.* (2007) noted that medical residents responsible for conducting handovers from ED to inpatient wards may have lacked adequate experience to differentiate pertinent from extraneous information, leading to irrelevant information exchange at handover. Poot *et al*. (2013) found that handovers conducted in maternity care were rated as better quality when the professionals involved had a higher level of clinical experience and McFetridge *et al*. (2007) suggest that more experienced ED nurses may be better able to prioritise the information which should be provided to ICU staff than their less experienced counterparts. However, Schoenfield *et al* (2014), who conducted a cross-sectional study of sign-out across several clinical specialities, reported that trainee medical staff were more likely than senior staff to conduct an adequate

sign-out and Goff *et al* (2014) found that medical residents were more likely to deliver handovers which meet the ACOG criteria for shift handover than nursing staff.

Perspectives and assumptions concerning which information to prioritise at transfer have been shown to differ among different health professionals, with reported difference found among anaesthesiologists and PACU nurses (Siddiqui *et al*. 2012). The provider and sender of information at handover may also differ in their perspectives and assumptions (Carroll *et al.* 2012; Riesenberg 2012; Beach *et al* 2012). In a study of nursing handovers, Carroll *et al.* (2012) observed that when the incoming nurse knew the patient, a more experienced outgoing nurse gave less adequate handoffs with less information. This assumption on the part of the sender may reflect the 'diagnosis momentum' referred to by Riesenberg (2012) and Beach *et al* (2012), whereby the sender overestimates the knowledge of the receiver and points to the role of prior relationships between professionals as a factor in the effectiveness of the communication and handover processes. This factor was evident in a study reported by Williams *et al*. (2007) who found that distortion in the amount and/or nature of information communicated among healthcare professionals was often the result of assumptions made on the part of the sender with respect to the level of information needed to be conveyed to the recipient; the study showed that more experienced surgeons often assumed too much about the information recipient's knowledge.

Communicating either too little or too much information may result in ineffective handover. Welsh *et al*. (2010) found that insufficient or excess information conveyed at the end-of-shift handover report by nurses was an impediment to the clarity of information and the recipients' comprehension of the information being reported. In a survey among ED department staff and an ambulance service, Jenkin *et al*. (2007) found that the ED nurses believed that ambulance staff often handed over information which was not essential to the patient's care. In a study of communication practices during service change in a US hospital, Hinami *et al.* (2009) reported that when incomplete information was communicated, more time was spent resolving associated issues and the recipients were more likely to express uncertainty regarding the patient's plan of care.

While repetition of handover information is generally considered inefficient (Bost *et al.* 2012; Ilan *et al.* 2012; Poot *et al.* 2013), it may serve to augment the communication process (Jenkin *et al.* 2007). For example, in their study of ambulance service to ED handovers, Jenkin *et al*. (2007) reported that physicians preferred to hear information repeated as they found it difficult to keep track of all the information in a single handover, and they believed that repeated information enabled them to obtain clarification for treatment.

Personal preferences and communication style may also impact on the quality of information exchanged during professional communications (Aase *et al.* 2011; Health Foundation, 2011, Sharit *et al*. (2008). For example, Sharit *et al*. (2008) cited differing communication styles as a potential difficulty during shift handover, since some physicians wished to receive information in a different order than was provided, causing delays and leading to interruptions. Lawrence *et al*. (2008), who examined shift handovers in the emergency care setting, referred to this role of 'professionalism' in handover, pointing to poor punctuality when attending team handovers and a reluctance on the part of the individual staff to accept the handover information and responsibility. Data from interviews conducted among critical care nurses suggested that the effectiveness of verbal communication appeared to be related to the commitment and interest of the individual nurse (Watts *et al*. 2005).

Mode of communication

The mode of communication used may also impede effective communications between professionals. Solet *et al*. (2005) described communication as being either mediated and direct, and suggested that the asynchronous nature of mediated information may be less effective than the direct method, which has the added benefit of non-verbal cues. There appears to

be a preference for synchronous, face-to-face communication in the healthcare setting (Woloshynowych *et al*. 2007; Philibert *et al*. 2009) and is typically recommended when professionals are questioned about strategies to improve communication (Coiera and Tombs 1998). For example, resident physicians believed that handovers were more vulnerable when face-to-face communication did not occur, when communication was not two-way and when there was no opportunity to clarify information (Philibert *et al*. 2009). Interns interviewed by Arora *et al.* (2005) similarly believed that a lack of face-to-face communication was more prone to failure and was often a factor in critical incidents involving patient safety. Interviewed by Sharit *et al*. (2008), PICU and PACU physicians believed that when handover did not occur at the bedside, important visual cues and context were missed. From observations of shift handovers among physicians in the ED, Maughan *et al.* (2011) reported that, while the findings of physical examinations were frequently omitted at handover, they were omitted less frequently when physicians used the electronic medical record, or made notes during handover, rather than relying solely on verbal processes. Matthews *et al.* (2002) conducted an observational study of physician to physician handover communications in an ED and identified spoken communication as a point where there was potential for error to occur. However, the mode of communication used in given scenarios may be at the discretion of the physicians' personal preference, or it may be that the nature of the issue to be communicated; for example a more complex patient may require a face-to-face verbal mode, whereas simple confirmation of patient stability may be achieved over a telephone communication (Beach *et al*. 2012).

A number of studies have tested the relative effectiveness of different modes of communication (Pothier *et al.* 2005; Bhabra *et al.* 2007; Craig *et al.* 2012b). For example, Bhabra *et al.* (2007) conducted a simulated trial of three handover methods, verbal, written notes and an electronically-generated or structured template containing relevant patient details, among senior house officers to test their impact on data retention and transfer. The greatest amount of data loss occurred in the verbal only handover group, with the group using written notes on a printed sheet showing the best information transfer. Moreover, the senior house officers' perspectives on which data points were important appeared to have no impact on the information that was actually transferred. Similar results were observed when the same trial was conducted among nursing staff (Pothier *et al.* 2005). Craig *et al.* (2012b) compared three methods of communication handoff in a real-life clinical setting, between general, internal medicine on-call and primary team interns. When a handwritten sign out form with no face-to-face, an electronic sign out form with no face-to-face, and a face-to-face handover were examined, the fewest errors were reported when face to face handover was conducted. Overreliance on memory and the burden of having to carry too much information communicated at handover have been reported as an issue in effective handover (Astrom. *et al.* 2007).

4.8.2 Enablers

While there are numerous strategies for improving handover communications, Ilan *et al.* (2012) suggest that these are based on expert opinion, for the most part, and have not been shown to impact on patient safety. Leonard and Frankel (2011) argue that in order to achieve effective teamwork and communication, several basic elements are required, among which include: structuring communication; fostering assertion and the use of critical language; promoting psychological safety and situational awareness; and effective leadership behaviours. In the studies examined for this review, the majority of reported enablers to effective clinical handover were derived from staff perceptions rather than data derived from patient outcomes. For this reason there is the potential for disparity between how researchers and clinical staff perceive the quality of handover. Staff have rated handover highly in spite of the absence of data elements and the prevalence of interruptions (Woloshynowych *et al.* 2007; Bost *et al.* 2012). Moreover, a number of studies have reported differences in perceptions on handover quality between different staff groups (Payne *et al.* 2000; Thakore and Morrison, 2001; Reader. *et al.* 2007; Fischer *et al.* 2012a), Chang *et al*. (2010) reported that paediatric interns who were interviewed following shift handover tended to overestimate the quality of the handover they delivered and suggest

that if interns overestimate how well they communicate information, they may be unlikely to verify that information has been received and understood correctly. Differences in perceptions on handover quality suggest that certain enablers may be more relevant to communication scenarios between specific disciplinary groups. However, this is not to suggest that staff perceptions do not provide a useful indication of how certain factors have the potential to enable more effective communication handover processes.

Organisational factors

Part of the difficulty with improving communication practices among healthcare professionals is the fact that the communication mode may be closely tied to professional identities, hierarchical structures, and the prevailing culture of the organisation (Lingard *et al*. 2004). Siemsen *et al.* (2012) suggest that healthcare organisations need to outline clear procedures for handovers, create supportive work environments, such as balanced workload and good staff-to-patient distribution, and establish environments where interruptions can be reduced. Physicians who participated in the Health Foundation (2011) study recommended that healthcare organisations should implement policies which ensure a time overlap during shift handover and which facilitate staff participation in handover. PACU physicians interviewed by Sharit *et al*. (2008) believed that sign-out could be improved by educating staff on the importance of information transfer and highlighting its potential impact on patient safety. Meisel *et al*. (2012) proposed the need to generate familiarity between emergency services and ED staff as a strategy for improving inter-professional communication.

Quin *et al.* (2009) observed the implementation of five standardised tools for night medical handover across four sites in Australia and reported that the most effective elements of organisational policy in the process were requiring all staff to be present at handover and requiring handover to take the form of a face to face meeting. The culture within healthcare organisations needs to be such that clinical handover and professional communications are both prioritised and recognised as a potential risk situation.

A number of studies point to the need to address professional hierarchies and professional boundaries within healthcare organisations as a means of improving inter-professional communication (Reader *et al.* 2007; Williams *et al.* 2007; Health Foundation, 2011). This involves establishing a culture of communication openness in order to generate a 'safe' environment in which team members feel that they can speak up and question other professionals if they have safety concerns (Reader *et al*. 2007); this entails a culture that permits staff members to challenge each other during communications (Health Foundation 2011). Randell *et al*. (2011) reported the benefits of a two-way communication process at shift handover across three UK sites, observing that asking questions allowed information to be corrected and verified and errors identified.

Several authors have recommended improving the quality of information available for communications and making it more readily available and up to date (Hinami *et al.* 2009; Philibert *et al.* 2009; Grobman *et al.* 201; Siemsen *et al.* 2012). Based on suggested solutions to problems with communication processes and systems solicited from multidisciplinary groups, Woods *et al.* (2008) listed having consolidated information in the electronic medicine record (EMR) as a means of addressing the issue of fragmented information. Siemsen *et al.* (2012) recommend that effective handover can be facilitated by all staff having full access to patient information and having compatible, accessible and supportive IT systems. Based on a study of the prevalence, format and structure of formal handover rounds in a number of Irish hospitals, Murphy *et al.* (2011) suggest that handover at ward rounds could be improved by making better use of electronic records and creating more comprehensive records. Since an improved IT infrastructure and a more accessible electronic health record (EHR) would demand structured data entry, Beach *et al* (2012) suggest that these systems could reduce some of the variability in terminology between units, and improve the completeness of information gathering. However, they also caution that such advancements in IT may reduce the need for verbal exchanges, meaning information

cannot always be clarified, resulting in a failure to directly address omissions of information such that they persist in the system. Electronic tools should be easy to use and operate within a time-constrained environment (Laxmisan. *et al.* 2007; Health Foundation, 2011); however, if implemented without due consideration of how they fit with existing processes, IT systems may not improve communications and may distract from patient care (Sharit *et al.* 2008)

Creating a work environment which limits interruption and distractions can promote more effective communication. Several studies have reported the views of health professionals who recognised the importance of an interruption-free environment as a critical factor in safe and effective handover. ED staff surveyed by Klim *et al.* (2013) believed that 'an appropriate environment' was one of the most important characteristics of a good handover, while PICU nurse managers surveyed by Sharit *et al.* (2008) believed that the ideal sign-out environment was one in which distractions were avoided. Similarly, Poot *et al.* (2013) found that maternity staff believed that handovers were of better quality and more orderly when they contained few or no interruptions. McCann *et al.* (2007) found that the nurses ranked the quality of handover as higher than their physician counterparts, possibly reflecting the fact that nursing handovers take place at a specific location and during protected time, indicating that a designated place and time for handover improves the process.

Using an appropriate communication mode

Although largely based on staff perceptions, it has been suggested that synchronous methods of communication, notably face-to-face handoff, may enable better handover communication (Arora *et al.* 2005; Sharit *et al.* 2008; Hinami *et al.* 2009; Welsh *et al.* 2010; McSweeney *et al.* 2011). A number of authors have reported the views of health professionals who support the use of face-to-face communication, including nursing staff (Welsh. *et al.* 2010), medical and nursing staff (Siemsen *et al.* 2012), medical interns (Arora *et al.* 2005), paediatric residents (McSweeney *et al.* 2011) and PICU physicians (Sharit *et al.* 2008), who also recommend that mandating bedside handovers would improve communications. Face-to-face handoffs are seen as important in facilitating clarity and comprehension (Welsh *et al.* 2010) and increasing the accuracy of the information transmitted (Philibert *et al.* 2009).

Synchronous communication modes also have the advantage of facilitating interaction and questions, which according to Ilan *et al.* (2012), are important in co-constructing a picture of the patient, asserting authority and/or expertise and mitigating errors. The level of questions asked during communications may act as a marker for the quality of the exchange. In observing communications between staff on maternity units, Poot *et al.* (2013) found that handover tended to be appraised as containing unnecessary items when more questions were asked, suggesting that questions were needed in order for staff to discern the relevance of the information. However, based on the level of interruptions they observed among surgeon communications in the critical care and trauma setting, Williams *et al.* (2007) suggest that asynchronous forms of communication might be more suitable in circumstances that are less interruptive. Given that verbal transfer of information among a large group appears to be error prone, Williams *et al.* (2007) also suggest that when this mode of communication is used, the number of individuals involved in the chain of communication should be reduced to enable a more effective exchange.

Using standardised methods

Based on staff recommendations elicited during surveys and/or interviews, several studies indicate that transferring information in a more systematic and standardised way may improve communication (Arora *et al.* 2005; Sinha *et al.* 2007; Williams *et al.* 2007; Welsh *et al.* 2010; Grobman *et al.* 2011; Bost *et al.* 2012; Siemsen *et al.* 2012; Klim *et al.* 2013) and reduce medical errors (Welsh *et al.* 2010). Laximisan *et al.* (2007), who conducted observations and semi-structured interviews with ED clinicians at a tertiary care centre, concluded that given the 'complex and cognitively

demanding' nature of communication in the ED, structured checklists tailored to clinicians should be introduced to reduce the burden on memory. Interviewed as part of the study by Welsh *et al.* (2010), nurses also indicated that having a shift report with a structured layout, or encompassing a checklist with space for notes, would improve the quality of handover. Based on interviews with medical interns, Arora *et al.* (2005) suggest that written communications during sign-out needs to be more legible with a designated list of content. Williams *et al.* (2007) recommend that the sign-out procedure be routinised and formalised to improve communication and information transfer in the critical care and trauma setting. Siassakos *et al.* (2013) concluded that maternity teams were safer and more effective if they tended to have more structured handovers of critical information, which were observed to broadly align with the SBAR format.

Clarity on locus of responsibility for patients is viewed as essential in assuring an effective handover process. Siemsen *et al.* (2012) suggest that the transfer of responsibility during communication needs to be made explicit and clear, to the extent that all clinicians are aware of who is responsible for patients during and following a handover report. Transparency as to who is responsible for patients is seen by physicians as essential in ensuring continuity of care across shifts (Philibert *et al.* 2009). Staff consulted by Wayne *et al*. 2008 in relation to a new shift handover sheet reported outstanding issues related to uncertainty around the point at which responsibility was transferred to the oncoming resident physician and difficulties in accurately identifying the on-call attending physician. Referring to handover in the operating room, Williams *et al.* (2007) recommend that tasks should be assigned unambiguously at handover.

Not all health professionals subscribe to the view that structured and standardised communication handover methods are effective; physicians consulted as part of the Health Foundation study on clinical handover (Health Foundation, 2011) and PACU residents interviewed by Sharit *et al.* (2008) expressed mixed views on the benefits of structured handover, with the latter suggesting that while a formal sign-out form might improve the process, it might also mean additional work for outgoing staff members.

Improving information content

The idea of the 'ideal' handover is explored in a number of studies, primarily with reference to the information elements deemed appropriate for inclusion in handover reports (Jenkin *et al.* 2007; McFetridge *et al.* 2007; Bump *et al.* 2011; Siddiqui *et al.* 2012; Wayne *et al.* 2008).

Effective communication should aim to be brief, concise and relevant (Hinami *et al.* 2009; Bump *et al.* 2011; Siemsen *et al.* 2012). Nurses interviewed by Welsh *et al.* (2010) believed that a shift report containing relevant information would improve the clarity and comprehension on the part of the recipient. PACU managers similarly recommended the use of computer-generated reports that can highlight relevant information, supplemented by verbal reports, to achieve maximum effectiveness (Sharit *et al.* 2008). Poot *et al.* (2013) observed that maternity professionals' opinion of handovers were higher where the duration of the handover was less than two minutes.

Using a language and terms which are common across all clinical specialties involved in handover is also seen as an important enabler in achieving more effective communication. Sheppard *et al.* (2008), who audited abbreviations used in general medicine and paediatric handover sheets and assessed staff understanding and interpretation of them, concluded that abbreviations used in written communications have the potential to create communication difficulties; they found that the types of abbreviations used across the two specialities were often different, with staff demonstrating poor understanding of each other's abbreviations. Owen *et al* (2009) reported that ED staff and paramedics can experience difficulties in translating information received from one another; for example, ED staff experienced difficulty in understanding paramedic terminology. Horwitz *et al.* (2009b) reported that vague anticipatory guidance may be delivered at shift handover, leading to a lack of clarity during the subsequent shift. Goff *et al* (2014) reported

that only 25 per cent of shift handovers observed among multidisciplinary professionals met the ACOG criteria for use of non-technical language.

Read-back and 'closing the communication loop'

The use of read back to verify information and close the exchange has been recommended as a way of improving communications (Williams *et al.* 2007; Hinami *et al.* 2009; Siemsen *et al.* 2012; Siassakos *et al.* 2013). Siassakos *et al.* (2013) recommend that verbalising can potentially resolve disparities in expectations and ensure that all members of the team are 'on the same page', while also keeping patients and relatives informed when present. These authors also reported that better teams were more likely to have used closed-loop communications to allocate critical tasks. Siemsen *et al.* (2012) suggest that verbalising the situation promotes team awareness and can ensure members of the team are aware of and recognise each other's competencies, while Williams *et al.* (2007) recommend redesigning surgeon-to-surgeon communication briefings to incorporate a confirmation that the information was received and understood.

While read back may be considered an enabler of more effective communication, the extent to which staff adopt and use it may depend on other factors. Limited availability of time, and lack of training in read back technique were reported as barriers to its use among multidisciplinary surgical staff in a study reported by Prabhakar *et al.* (2012). These authors also reported that resident physicians were less likely to endorse the use of read back as compared to staff providers and nursing staff. Spooner *et al* (2013), who developed a semi-structured handover sheet for ICU nurses, suggest that read-back may not have been embraced readily as nurses were ill-equipped with the requisite skills or training in how to use it effectively. Perry *et al* (2008.) caution that 'the global benefits of read back are less clear' and suggest that simply reading back information 'does not verify synthesis and understanding, nor does it ensure remembering and performance of the task'.

4.9 Communication and handover tools and processes

Forty-one studies were identified that evaluated the use and effectiveness of mnemonic tools, including problem-based standardised checklists and electronic tools to support handover. Mnemonics most-commonly tested were the SBAR and the ISBAR and, to a lesser extent, the IMIST AMBO. Several studies also assessed multi-component protocols. There follows a review of these studies.

4.9.1 Topic standardisation

SBAR

Despite the body of work advocating the use of SBAR, few rigorous research designs have been reported that examined its effectiveness. Of the 18 studies and one unpublished thesis identified that evaluated SBAR, just three described different analyses of the same intervention (Cornell *et al.* 2013; Cornell *et al.* 2014, Townsend-Gervis *et al* 2014) and just two used a randomised controlled trial (RCT) design (Cunningham. *et al.* 2012; Joffe. *et al.* 2013a); both of these studies investigated the use of the tool during telephone referrals.

Results from an Australian RCT involving medical interns suggest that the SBAR tool may produce a greater effect when it is used by less experienced practitioners. Cunningham *et al.* (2012) demonstrated an improved global rating score of simulated telephone referrals conducted by interns who had received a ten-minute training intervention in the use of SBAR. They also reported a reduction in the time taken to present the referral, but were unable to demonstrate improvement in their primary outcome measure, an objective rating of communication based on the transfer

of critical data during the referral. Joffe *et al.* (2013a) examined whether using SBAR to structure after-hours phone calls from nurses to physicians in internal medicine would impact on the quality of patient information transferred. Based on simulated cases and using nursing referrals supported by nurses' own notes as a control, the group that conducted referrals using SBAR demonstrated a higher rate of reporting the reason for patient hospitalisation; however, in both intervention and control scenarios, the nurses failed to report data items coded under background and situation cues, with incorrect or misleading information being reported even when SBAR was used. In a follow-up analysis Joffe *et al.* (2013b) examined whether the quality of nurses' communication would impact on the receiving doctor's actions and found that in over half of the cases the doctor failed to treat the cause for the clinical condition; this failure was observed when the background cue supplied was poor. However, the use of doctors' 'appropriate action' was a non-validated outcome measure and the study was further limited by the use of simulated cases and by the fact that the use of the SBAR tool was encouraged rather than enforced; hence it is not possible to say with certainty whether the communication of basic data elements resulted from the use of the SBAR tool or was a function of the nurses' experience.

Two before-and-after-intervention studies showed a possible association between SBAR use and improved patient outcomes (De Meester *et al.* 2013; Haig *et al.* 2006). Conducted at a tertiary hospital in the Netherlands, De Meester *et al.* (2013) reported on a study to test the effectiveness a two-hour training intervention for nurses on the use of SBAR at shift handover and when communicating to physicians about deteriorating patients. The authors demonstrated a significant decrease in the number of unexpected deaths per 1000 admissions and an increase in the number of unplanned ICU transfers in the post-intervention period. While increased transfers resulted when more deteriorating patients were brought to the attention of physicians, the authors could not confirm if the SBAR tool was used during verbal communications about deteriorating patients. Haig *et al.* (2006) reported the results of a quality improvement programme, in which SBAR was implemented throughout a medical centre in the US; the SBAR was effective in reducing medication reconciliation errors and adverse events following the intervention, with the rate of adverse events calculated on the basis of randomly-selecting 20 patient events per month and scaling up to 1000 patient days.

In a prospective intervention study, Randmaa *et al*. (2014) compared two anaesthetic clinics in Sweden, one of which delivered SBAR training and asked staff to use SBAR during communications with other professionals. Although incident reports were found to decrease in both intervention and control groups, a significant decrease in the percentage total of incident reports was attributable to communication failures in the intervention group. Two studies investigated the impact of structured communication in interdisciplinary rounds at a single acute care hospital on patient outcomes (Cornell *et al.* 2014; Townsend-Gervis *et al.* (2014). The intervention involved a staggered introduction of SBAR among nurses for use in shift change reports and physician rounds and showed improvements in two outcome measures over the study period: improved performance on Foley catheter removal and reduced likelihood of readmission (Townsend-Gervis *et al*. 2014; Cornell *et al.* 2014).

Other studies have indicated that use of SBAR may improve the efficiency of communication processes. The SBAR form has been shown to improve the consistency of shift report, in terms of a greater amount of time spent on other shift report tasks and on verbal communication (Cornell *et al.* 2013); improved efficiency of the handover process, with a 60 per cent reduction in the time taken to handover each patient (Sohi *et al.* 2011); higher quality physician documentation of patient events, when compared with paper chart documentation or electronic documentation with free-text notes (Albert *et al.* 2012); and increase in the content transferred per patient at sign-out when SBAR pocket cards were used (Bavare *et al* 2013). Grover and Duggan (2013) conducted a before-and-after audit of handover communications between anaesthetists and recovery nurses in an Irish hospital which advised staff in the use of SBAR and COLD (Connect, Observe, Listen, Delegate) principles, and reported a significant increase in handover of patient name, an increase in medical background information handed over, but no change in the

number of handovers which contained instructions or recommendations. McCrory *et al.* (2012) showed that training paediatric interns in the use of the ABC (airway, breathing, circulation)–SBAR mnemonic resulted in a significant increase in medical interns' use of the Assessment or Recommendation component of SBAR following training.

A number of studies reported improvements in staff perceptions of communication and attitudes to patient safety following the introduction of the SBAR tool. Staff reported improvements in between-group communication accuracy and safety climate (Randmaa *et al.* (2014), increased overall satisfaction with handover (Moseley *et al.* 2012; Haig *et al.* 2006 Manias *et al.* 2011) and a significant increase in perceived effectiveness of communication (PEC) score (Ormilon *et al.* 2012). Bavare *et al.* (2013) also reported that perceptions of sign-out completeness and comprehensibility increased following the introduction of the SBAR pocket card system and Beckett *et al.* (2009) found that implementing the SBAR Collaborative Communication Education improved staff perceptions of communication quality and elicited an overall a positive response. In an unpublished thesis, Gerard (2012) reported that nurses perceived that nurse-physician collaboration had significantly improved after the adoption of the SBAR protocol and that both nurses and physicians believed that the Recommendation statement in the protocol was overly assertive.

Not all studies demonstrated improved staff satisfaction with the use of SBAR. For example, the Irish study reported by Grover and Duggan (2013), which advised staff in the use of SBAR and COLD tools, reported no significant change in nurse satisfaction with handover. (Velji *et al.* 2008) reported no significant improvements in staff perceptions of patient safety culture or team communication following the introduction of SBAR at a stroke rehabilitation unit in Canada; however a significant improvement in perceptions was observed when critical ratio tests were applied and a larger, more comprehensive follow-up evaluation as part of the same project (Andreoli *et al.*, 2010) demonstrated a significant improvement in staff perceptions of patient safety and team communication.

Vardaman *et al.* (2012) reported that some nursing staff felt that using the SBAR tool gave them a sense of legitimacy in their communications with doctors and allowed newly recruited nurses to more quickly gain legitimacy with co-workers. Andreoli *et al*. (2010) found that team members reported increased confidence and assertiveness during their communications using SBAR. However, other reports on the introduction of SBAR have suggested that there may be initial resistance to the use of the tool, particularly with respect to the R (Recommendation) component; for example, nurses at one US tertiary centre reported that they did not feel comfortable making a recommendation to physicians as, in many cases, they did not know what to recommend (Burton *et al*. 2010). Andreoli *et al.* (2010) similarly reported a tendency on the part of staff to report the S and B components, but not to provide their Assessment or Recommendations.

Reported staff perspectives on the use of SBAR indicate that it is simple and easy to use (Burton. *et al.* 2010, Wyckoff, 2011; Wentworth *et al.* 2012), is associated with staff satisfaction (Manias and Tomlinson, 2011) and has the potential to reduce handover time (Sohi *et al.* 2011). Williamson *et al.* (2011) found that the implementation of the SBAR tool, along with staff training among clinical and non-clinical staff, improved patient-centred communication, increased staff satisfaction and improved continuity of care, as measured through staff feedback. However, Hamilton *et al*. 2006 argue that a simple four-hour training programme in SBAR may not be sufficient to produce large changes in knowledge, attitudes and behaviours.

The various studies reporting the use of SBAR have several limitations. The two effectiveness studies cited (Cunningham *et al.* 2012; Joffe *et al.* 2013) were limited by the fact that the assessors were not blinded to allocation, which may have resulted in biased assessment of the quality of telephone communications, and by the small sample sizes, which comprised 66 interns (Cunningham *et al.* 2012) and 20 nurses (Joffe *et al.* 2013), respectively. Moreover, the before-and-after design studies (De Meester *et al.* 2013; Haig *et al.* 2006) did not allow cause and effect to be established. The

many studies reporting staff perceptions and attitudes to the introduction of SBAR are inherently limited, since a change in perceptions of communication quality does not necessarily translate to improved communication or a reduction in communication failures.

ISBAR

A number of studies reported the use and effectiveness of the ISBAR mnemonic tool. Of these, just one was an intervention trial (Marshall *et al.* 2009; Marshall *et al.* 2012), one was a before-and-after design (Thompson *et al.* (2011) and the remainder were anecdotal reports. Marshall *et al.* (2009) tested the impact of a comprehensive educational intervention on communications among medical students in Australia. Using the ISBAR protocol for simulated telephone referrals in the management of an unstable patient, the quality of referral communication was scored with reference to the need for prompts and whether information was concise, hesitant and so forth. Based on a global rating score for pre-defined items of communication quality, the authors reported a higher mean total item score and significantly higher clarity ranking on the global rating score among the intervention group. Follow up measures of communication quality at six months showed that scores, while lower than those observed in the immediate post-intervention trial, were still significantly improved when compared to the control group. These findings suggest that the ISBAR training intervention was effective over the longer term (Marshall *et al.* 2012).

Like the two RCTs to test the SBAR, the limitations of the ISBAR trials relate to the fact that the researchers scoring the referrals were not blinded to group allocation and the study samples were relatively small; in the Marshall *et al.* (2009) study there were just 8 intervention and 9 control subjects.

Conducted among NCHDs in Australia, Thompson *et al.* (2011) used a before-and-after design to examine the effectiveness of ISBAR and demonstrated improved participant perceptions of handover after training in the use of ISBAR. Participants judged handovers to be more consistent, better structured, and with fewer omissions of information after the ISBAR tool was introduced and there was an observed increase in the number of clinical information items transferred during handovers. However, the duration of handover did not increase and there was no significant change in doctors' perceptions of whether the amount of information they had received was sufficient to meet their needs. Additionally, some doctors expressed concern that the ISBAR tool might be 'less flexible' and 'less useful' for certain types of handovers. Mardegan *et al* (2013) reported a positive staff response to the introduction of the ISBAR format for handoff between ward staff and the arriving medical emergency team. Published anecdotal reports suggest successful implementation of the ISBAR mnemonic as part of communication improvement projects in both Ireland (INMO 2013) and Australia (Aldrich *et al.* 2009; Finnigan *et al.* 2010).

As part of the Australian Clinical Handover Initiative, a variation of ISBAR, the ISoBAR tool (Identify,-Situation-Observations-Background-Agreed plan-Read back), was developed and piloted across six regions of the Western Australia Country Health Service for use in inter-hospital transfers (Porteous *et al.* 2009; Western Australia Country Health Service, 2009; Bell *et al*. 2009). The Observations component of the modified tool served as a baseline of factual information from which to devise the plan of care. The reported outcomes of the pilot studies ranged from positive responses to non-engagement by staff. Pilot participants reported that the Identification and Observation components may be less relevant in an allied health context and some believed that the iSoBAR tool did not capture information considered essential for clinical handover, including: clear and extensive patient contact details, contact details of the handover clinician, and clear information on the expectations of the receiving allied health professional (AHP) such as timing, frequency of therapy, protocols and equipment requirements (Bell *et al.* 2009).

IMIST AMBO / deMIST

Two studies reported the use of the IMIST AMBO, and a derivative, in emergency care settings. Iedema *et al.* (2012) reported the outcomes of a before-and-after pilot study involving training of almost 400 staff in the use of the IMIST AMBO tool. Based on video-taped observation of handovers between ambulance personnel and ED staff, the authors demonstrated shorter handover duration, a decrease in the number of questions asked by triage nurses after the handover, and a reduction in repeated content delivered by ambulance personnel when the IMIST AMBO tool was used. In a two-stage, prospective intervention study conducted at two EDs in the UK to investigate the impact of a modified version of the MIST mnemonic – deMIST replacing Identification with Demographics – Talbot and Bleetman (2007) found a higher average accuracy in retention of verbal information by ED staff when deMIST was *not* used. However, just 10 handovers were observed before and after ambulance staff were asked to structure their verbal handover using the mnemonic and the study assessed recall only.

Problem based versus somatic tools

The majority of mnemonics, including SBAR and ISBAR, are classified as problem-based standardisation tools, which structure communications around the patient's presenting condition, as distinct from body-system based tools, which structure information by somatic systems, like the respiratory and cardio-vascular. Just one study was identified, which compared the effectiveness of the two types. In the study Abraham *et al.* (2013) compared an indigenously-developed tool, the HANDOFF Intervention Tool (HAND-IT), a checklist tool which organised content categories under physical examination/laboratories, medications, problem list, assessment, plan and system diagnosis for each body system, with a common problem-based tool, the SOAP (Subjective-Objective-Assessment-Plan). The authors hypothesised that HAND-IT would result in more effective communication during team handover at shift change on the basis that it encourages physicians to evaluate patient data both holistically and as discrete units, aiding their understanding of the causal determinants of the patient's conditions, rather than structuring information by patient's key problems. After observing handover rounds among two ICU teams, each of which underwent training in SOAP followed by training in HAND-IT, the authors observed fewer communication breakdowns, based on accuracy, completeness and the need for intervention by other team members, when the teams used HAND-IT, and more communication breakdowns when teams used the SOAP tool.

Jukkala *et al.* (2012) reported improvement in the perceived quality of nurse communication during shift handover report following a before-and-after pilot of the MICU communication tool, a standardised somatic tool comprising a human figure front view and text to guide communication specific to body systems, basic laboratory work, procedures, and social/family concern.

Other mnemonics

Other mnemonics have been tested for their effectiveness in a range of outcome measures, including user perceptions, duration of handover and quantity and quality of information transferred. Two interventions studies using intervention and control groups were reported. Using an RCT design, Bump *et al.* (2012) tested the effectiveness of a training intervention which incorporated the SIGNOUT mnemonic (Sick or DNR-Identifying data-General hospital course-New events of the day-Overall health status/clinical condition-Upcoming possibilities with plan, rationale-Tasks to complete overnight with plan, rationale) on the content and quality of general medicine interns' communication at sign-outs. The intervention resulted in significantly improved content of sign-outs and more consistency, in terms of the data items recorded, among the intervention group. Weller *et al.* (2014) used a randomised, blinded before-and-after design to test a video-based educational intervention for anaesthetists in the use of the SNAPPI handover tool (Stop the team-Notify of the patient's status-Assessment of the situation-Plan what to do-Priorities for actions-Invite ideas). They reported an increase in the number of verbalised, diagnostic

options a greater increase in the sharing of specific 'information probes' among the intervention group compared with the control.

Several studies used a before and after design to evaluate mnemonics. Rudiger-Sturchler *et al.* (2010) examined the effectiveness of the dINAMO mnemonic (Doctor remember-Identify patient-Needs of patients and chief complaints-Analysis and state of the situation-Medical management and planned treatment-Organisation and planned transfer, discharge) to structure a checklist at the ED of a tertiary care centre in Switzerland. The intervention showed a reduction in the duration of shift handovers and a significant decrease in the amount of perceived missing or wrong information provided at handover. Using a post-intervention survey, Connor *et al.* (2013) investigated the impact of the IMOUTA mnemonic (Identifying information-Medical course-OUtcomes possible tonight-To do tonight-Ask question and handoff) on medical residents' perceptions of handover quality. The authors reported an improvement in residents' knowledge of patient's diagnoses, hospital course, active concerns and treatment plans, and improvement in overall comfort with the handover and perception of preparedness for the shift ahead. Gopwani *et al*. (2013) reported an increase in the percentage of successful handoffs and improved completeness of handoffs following the introduction of SOUND tool (Synthesis-Objective Data-Upcoming Tasks-Nursing Input-Double Check) to structure handoffs in the ED of a US hospital. After introducing the SAFE tool (Sick patients-At risk-Follow-ups-Epidurals) to guide obstetric anaesthesia handovers on the labour ward at a London hospital, Dharmadasa *et al* (2013) observed improvements in the rate of handover of each of the four elements of the mnemonic; however, after fifteen months the SAFE tool was not used consistently and the rate of information transfer within each of the four elements had decreased. The decline in handover performance was reversed following staff retraining. Following an intervention to educate paediatric interns in the use of SAFETIPS to structure handovers, Shaughnessy *et al.* (2013) found that, while the inclusion of key information had improved, there was no improvement in other communication behaviours, including read-back and the use of verifying questions.

In order to improve the communication of operational issues during handovers among ED staff, one UK hospital implemented and evaluated 'the ABC of handover' protocol (Farhan *et al*. 2010). Developed through observations of handover practice and interviews with ED staff (Farhan *et al.* 2012), the handover protocol consisted of a standardised template form based on the ABCDE mnemonic (Areas and Allocation; Beds, Bugs and Breaches; Colleagues and Consultant on call; Deaths and Disasters, including Deserters). Farhan *et al.* (2010) reported an improvement in most areas of handover content, particularly with respect to operational issues, and could link several instances of information items being handed over to their impact on the subsequent shift. Several other mnemonics are reported in the literature; however, none are supported by research evidence. These are summarised in Annex 5 (in the literature section).

Three reports of mnemonics used in maternity settings are reported here:
Hatten-Masterson and Griffiths (2009) reported on the use of the SHARED mnemonic (Situation-History-Assessment-Risk-Expectation-Documentation), developed at two Australian hospitals to improve the quality of handover between midwives and visiting medical officers (VMO). The authors indicated an improvement in 'adequate overall' documentation and an increase in patient satisfaction.
Reports on the implementation of the CHAPS tool, originally developed as part of a collaborative improvement program between two NHS Trusts in the UK, showed good uptake, increased staff satisfaction with handover and improved perceptions of communication (Ottewill *et al*. 2007), reduced handover duration (Owen and Candelier, 2010), a reduction in the numbers of clinical incidents (Owen and Candelier, 2010; Basu *et al.* 2011), and good quality of information transfer (Basu *et al.* 2011), albeit with some loss or omission of information (Ottewill *et al*. 2007).
Gephart *et al.* (2012) describe a guide to conducting clear communication in the perinatal and neonatal setting using the PURE mnemonic (Purposeful–Unambiguous–Respectful-Effective). The PURE guide specifies that the reason for contacting another member of the maternity team must be articulated, the language used must be clear, team members must respect other professionals

and their competencies, and conversation should be effective in the sense that it verifies that both sender and receiver understand the goal

Rice *et al.* (2010) reported a pilot study to implement an intervention to improve inter-professional collaboration and communication among staff on two general internal medicine wards of a Canadian hospital. Staff were asked to structure patient-related interactions using a four step structure: 1. Introduction, 2. Statement of role in team, 3. Sharing of profession-specific issues and concerns relating to the patient, and 4. Eliciting specific feedback from other professionals on the team. Based on direct observations and interviews with key informants, the authors reported that the uptake of the intervention was low and pilot study participants cited time pressure during interactions along with long-standing hierarchical structures as barriers to using the protocol. The four-step structure was a component of a larger cluster randomised trial of a teamwork protocol entitled SCRIPT (Structuring communication relationships for inter-professional teamwork), which examined the effects on length of stay, readmissions and staff members perceptions (Zwarenstein *et al.* 2007).

Table 5 Empirical studies which evaluated mnemonics

Author	Tool	Design	Setting and sample	Context	Outcomes
SBAR					
Andreoli *et al* (2010)	SBAR	Before-and-after	Canada: Single site Geriatric rehabilitation (GR) and musculoskeletal (MSK) units Multidisciplinary staff (n=74 survey respondents before; n=59) respondents after)	Communication among inter-professional teams	Tendency on the part of staff to report the S and B components but not to provide their Assessment or Recommendations.
Albert *et al* (2012)	EHR template structured by SBAR	Before-and-after	US: Single site PICU (n=542 admissions)	Documentation of patient events	Higher quality documentation of patient events by physicians when SBAR template used compared to when only paper chart documentation, or electronic documentation with free-text notes were used.
Bavare *et al* (2013)	SBAR pocket template	Before-and-after	US: Single site Medical and surgical PICU in the US Clinicians (n=48). (n=402 sign-out reviewed before implementation; n=333 patients after implementation)	Verbal shift handover	Increase in the content transferred per patient at sign-out. Perceptions of sign-out completeness and comprehensibility increased.
Beckett *et al* (2009)	SBAR Collaborative Communication Education (SBAR-CCE)	Before-and-after	US: Single site Paediatrics/Perinatal Multidisciplinary staff (n= 212)	Multiple	Improved staff perceptions of communications.
Cornell *et al* (2013)	Staggered introduction of Interdisciplinary rounds (IDR), paper and electronic SBAR report	Before-and-after	US: Single site Medical-surgical units. Nursing staff (n=75)	Shift handover	Increased time spent on other shift report tasks when using SBAR tool. Increase in verbal communication used when SBAR tool in use. Decreased time spent on writing paper shift report but not electronic. Overall duration of report unchanged.

Table 5 cont. Empirical studies which evaluated mnemonics

Author	Tool	Design	Setting and sample	Context	Outcomes
Cornell *et al* (2014)	Staggered introduction of Interdisciplinary rounds (IDR), paper and electronic SBAR report.	Before-and-after	US: Single site Medical-surgical units. Nursing staff (no number reported)	Shift handover	Use of IDR reduced patient review times. Utilisation of the SBAR tool reduced review times. Use of the electronic SBAR tool was associated with significantly longer review times than when paper based was used. No association with LOS.
Cunningham *et al* (2012)	SBAR educational session	RCT	Australia: Single site Medical or surgical interns (n=69)	Simulated telephone referrals	Improved Global Rating Score in intervention group. Non-significant improvement in data items communicated. No change in subjective self-rating. Intervention group took less time to conduct telephone referral.
De Meester *et al* (2013)	SBAR training in conjunction with ABCD	Before-and-after	Belgium: Single site Medical and surgical units Nursing staff (n=425)	Communicating about deteriorating patients Shift handover	Decreased number of unexpected deaths per 1000 admissions. Increase in the number of unplanned ICU transfers. SBAR elements recorded more frequently in patient records after implementation.
Grover and Duggan (2013)	SBAR and COLD educational session	Before-and-after	Ireland: Single site Post-anaesthesia recovery room. Anaesthetists (no number reported)	Inter-departmental OR to recovery room.	Improvement in the handover of Assessment or Background data. Improvement in the handover of some recommendation data. Improvement in handover of patient name.
Gerard, J.C. (2011)	SBAR educational session and learning aids	Before-and-after	US: Single site ICU Nurses (n =28) Physicians (n=30)	Multiple.	Nurses felt nurse-physician communication had improved, physicians did not. Both groups indicated in interviews that the Recommendation element may have been too assertive.
Haig *et al (2006)*	SBAR	Before-and-after	US: Single site Multiple specialities Nursing staff (no number reported)	Multiple.	Authors report reduction in medication reconciliation errors, and adverse events but do not provide information on how this was assessed. Reported staff compliance and satisfaction.

Table 5 cont. Empirical studies which evaluated mnemonics

Author	Tool	Design	Setting and sample	Context	Outcomes
Jindal *et al* (2013)	Pro forma integrated with SBAR	(poster) Before-and-after	UK: Single site Obstetrics and Gynaecology Doctors (no number reported)	Shift handover	When the pro forma was not used, there was a lack of continuity of care and a few medical errors.
Joffe *et al* (2013a)	SBAR structured form	RCT	US: Single site Nurses-physician pairs (n=22) n=92 phone calls	Simulated telephone referrals	The use of the SBAR did not improve performance during patient case communication by phone call. Data elements relating to Situation were reported with and without the use of the tool.
Joffe *et al* (2013b)	SBAR structured form	RCT	US: Single site Nurses-physician pairs (n=22) n=108 phone calls	Simulated telephone referrals	Physicians were observed to fail to treat the cause for the clinical condition, when the Background information supplied by nurses was poor.
Manias *et al* (2011)	SBAR	Before-and-after	UK: Single site Obstetric staff (no number reported)	Verbal discussion of obstetric emergency cases	Increase in staff satisfaction.
McCrory *et al* (2012)	ABC – SBAR educational session	Before-and-after	US: Single site Paediatric interns (n =26)	Communicating about deteriorating patients (simulated scenario)	All handoffs improved in overall score with the exception of one. Increase in the number of handoffs including an Assessment or Recommendation. Decrease in elapsed time from the start of hand-off until the intern stated essential content items. Increase in total elapsed time of hand-off.
Moseley *et al*(2012)	SBAR structured form	(pilot) Before-and-after	US: Single site General Neurology, Stroke, and Neurologic ICU Postgraduate neurological residents (n =33 survey respondents before; n= 20 survey respondents after)	Shift handover	Increase in the % of residents who felt that important information was transmitted at handover. Increase in overall satisfaction with sign-out. Deficits in information transferred persisted with new tool.
Ormilon *et al* (2012)	SBAR	(abstract) Before-and-after	US: Single site Nursing staff (no number reported)	Shift handover	Improvement in perceived effectiveness of communication (PEC) after implementation.

Table 5 cont. Empirical studies which evaluated mnemonics

Author	Tool	Design	Setting and sample	Context	Outcomes
Randmaa *et al* (2014)	SBAR card and SBAR educational session	Before-and-after	Sweden: Two sites OR, ICU and PACU Nurses, physicians. Intervention site (n=139 respondents before; n=100 after) Non-intervention site (n=122 respondents before; n=69 after)	Multiple.	Improved perception of between group communication accuracy. Improved perception of safety climate. Reduction in incident reports.
Sohi *et al* (2011)	SBAR educa-tional session	(abstract) Before-and-after	UK: Single site Paediatric trainees (no number reported)	Shift handover	60% reduction in the time taken to handover each patient.
Townsend-Gervis *et al* (2014)	Staggered introduction of Interdisci-plinary rounds (IDR), paper and elec-tronic SBAR report.	Before-and-after	US: Single site Nursing staff (n = 111) Acute hospital	Shift handover	Improved performance of Foley catheter removal Patient satisfaction with nursing care showed a non-significant improvement. 30 day readmission rates improved over study period.
Vardaman *et al.* (2012)	SBAR	Case study	US: Two sites Medical-surgical units Nurses, nurse managers, doctors (28 interviews (5 doctors, 9 nurse managers, and 14 staff nurses) (52 interviews (staff nurses))	Multiple	SBAR useful for constructing a mental model to aid patient evaluation. SBAR may legitimise practice for nurses. SBAR may aid development of social capital among staff.

Table 5 cont. Empirical studies which evaluated mnemonics

Author	Tool	Design	Setting and sample	Context	Outcomes
Velji *et al* (2008)	SBAR	Before-and-after	Canada: Single site Stroke Rehabilitation Unit Multidisciplinary staff (n=43)	Communication among inter-professional team	No significant improvements in staff perceptions of patient safety culture or team communication following the introduction of SBAR. Significant improvement in perceptions observed when critical ratio tests were applied. No significant trend in patient safety incident reporting.
ISBAR					
Mardegan *et al* (2013)	Medical Emergency Team (MET) running sheet in ISBAR format.	Before-and-after	Australia: Single site MET staff (n=256 after survey)	Emergency response to deteriorating patient	Positive staff response. Good compliance recorded.
Marshall *et al(2009)*	ISBAR educational session	RCT	Medical students (n=168) 17 groups (9 intervention, 8 control).	Simulated telephone calls	Improvement in information transfer among intervention phone calls, that is, an increase in the number of data items communicated. Improvement in a clarity of communication.
Marshall *et al(2012)*	ISBAR educational session	RCT	Medical students (n=17) who received educational intervention six months prior	Simulated telephone calls	Information transferral improved compared with control but less so than when rated immediately after the intervention. Improved clarity compared with control but less so than when rated immediately after the intervention.
Thompson *et al* (2013)	ISBAR	Before-and-after	Australia: Single site Junior Medical Officer (JMO) (n=44)	After hours shift handover	Increase in the number of clinical information items transferred during handovers. Duration of handover did not increase. No change in doctor's perceptions of whether the amount of information they had received at handover was sufficient to meet their needs, and Some JMO expressed concern that the ISBAR tool might be 'less flexible' and 'less useful' for certain types of handovers.

Table 5 cont. Empirical studies which evaluated mnemonics

Author	Tool	Design	Setting and sample	Context	Outcomes
Other mnemonics					
Abraham *et al* (2013)	Comparison of SOAP and HAND-IT tool	Before-and-after	US: Single site MICU Interns and residents (n = 10)	Shift handover	Greater number of communication events when using HAND-IT and fewer communication breakdowns than when using SOAP. Fewer breakdowns relating to diagnostic evaluation, management and treatment when using HAND-IT.
Adams et al. (2011)	7 P's	Post-implementation review	US: Single site EM residents, IM residents (no number reported) (n=78 handover observed)	Inter-departmental handover. EM to IM	Correlation between the number of Ps communicated and the overall quality of the handover.
Bump *et al* (2012)	SIGNOUT educational session, written handout, feedback from faculty members	RCT	US: Single site General medicine residents (n=31)	Shift handover	Significant improvement in the content recorded at sign-out along with consistency of data items recorded.
Connor *et al* (2013)	IMOUTA	Before-and-after	US: Single site On-call otolaryngology residents (n = 15)	Shift handover	Improvement in perceived knowledge of patient diagnosis, hospital course, active concerns and treatment plans. Improvement in overall comfort with handover. Improved perception of preparedness for oncoming shift.
Dharmadasa *et al*(2013)	SAFE	Before-and-after	UK: Single site Maternity unit Obstetric anaesthesia trainees (no number reported) (n=23 handover before; n=23 after; n=27 handovers after 15 months, n=27 after retraining)	Shift handover	Improvements in the rate of handover of each of the four mnemonic elements Non-significant increase in rate of handover of follow-up and epidurals. After 15 months, the pro forma was not used consistently but improvements noted again following re-training.

Table 5 cont. Empirical studies which evaluated mnemonics

Author	Tool	Design	Setting and sample	Context	Outcomes
Farhan *et al* (2010)	The ABC of handover	Before-and-after	UK: Single site Emergency Department Multidisciplinary staff (no number reported) (n=41 handover before; n=42 handovers after)	Shift handover	Improvement in transmission of information related to operational details. Participants agreed tool improved handover. Increase in the reporting of staffing issues during handover.
Gopwani et al. (2013)	SOUND	Before-and-after	US: Single site Emergency Department Trainee and staff physicians (no number reported) (n=286 handovers before; n=352 after)	Shift handover	Significant increase in the percentage of successful handovers. A mean increase in handover time.
Iedema *et al* (2012)	IMIST AMBO	Before-and-after	Australia: two sites ED clinicians and ambulance paramedics (n=398) (n=73 handovers before; n=63 after)	Inter-departmental handover	Shorter handover duration. Decrease in the number of questions asked by triage nurses after the handover. Reduction in repeated content delivered by ambulance personnel.
Rice *et al(2010)*	Four step guide for structuring interactions between professionals	(pilot) RCT using qualitative methods of comparison.	Canada: Single site Multidisciplinary staff on (n=250) Internal medicine, Clinical Teaching Units (CTU)	Multiple.	The uptake for the intervention was low. There was low awareness. Little difference between the intervention and control groups.
Rudiger-Sturchler *et al* (2010)	dINAMO	Before-and-after	Switzerland: Single site Emergency Medicine (EM) Senior physicians (n=9) Residents (n=11)	Shift handover	Decrease in mean duration of handover. Decrease in the amount of perceived missing or wrong information at handover. Non-significant increase in the perceived quality of handover.
Shaughnessy *et al* (2013)	SAFETIPS educational session	Before-and-after	US: Single site Paediatrics and internal medicine interns (n=27) (n=23 observed before-intervention; n=25 observed after intervention)	Shift handover	Improvement in inclusion of key content. No increase in use of read-back post-intervention. No change in number of questions asked during handover.

Table 5 cont. Empirical studies which evaluated mnemonics

Author	**Tool**	**Design**	**Setting and sample**	**Context**	**Outcomes**
Talbot and Bleetman (2007)	deMIST	Before-and-after	UK: Two sites ED staff and ambulance personnel (10 handovers at each site)	Inter-depart-mental hando-ver	Average accuracy of data retained by receiving staff when deMIST used was 49.2%, when not used, it was 56.6%.
Tapia *et al.* (2013)	PACT	Before-and-after	US: Two sites Junior and senior residents (n=114 handovers before; n=140 handovers after)	Shift handover	Increase in discussion of PACT. Increase in handoff time. Decrease in the incidence of incomplete tasks and lack of patient knowledge. Senior residents reported junior residents were better able to handle emergencies.
Weller *et al* (2014)	SNAPPI educational session	Randomised, blinded pre-post design	New Zealand: Two sites Simulated PACU Anaesthetists (n=43; n=40 had paired data available for analysis)	Communica-tion during sim-ulated critical events	Number of verbalized diagnostic options increased significantly in the SNAPPI group. Team information probe sharing increased to a greater degree by from base-line to follow-up in the intervention group.

4.9.2 Content standardisation

Standardised checklists, forms and protocols: Between-unit handovers

Standardised checklists or forms have been evaluated primarily in the context of handover between the OR and ICU or PICU (Joy. *et al.* 2011; Zavalkoff. *et al.* 2011; Craig. R. *et al.* 2012; Petrovic. *et al.* 2012; Smischney. *et al.* 2012; Karakaya. *et al.* 2013) or PACU (Salzwedel. *et al.* 2013), with the checklist usually developed after consultations with multidisciplinary staff members (Zavalkoff. *et al.* 2011; Petrovic. *et al.* 2012; Salzwedel. *et al.* 2013) or following a review of the literature (Karakaya. *et al.* 2013). Intervention designs have included before-and-after designs and the RCT.

The literature indicates that standardised forms and checklists may improve information transfer at handover, but not in all outcome measures. Zavalkoff *et al.* (2011) reported the findings of a small scale before-and-after trial of a standardised form to improve handover between OR and cardiac PICU at a tertiary care centre in Canada; the authors found a significant improvement in the observed completeness of information after the checklist was introduced, but no impact on handover duration. Karakaya *et al.* (2013), who observed the effect on verbally-communicated information of a structured information transfer checklist for OR to PICU handover, reported a significant overall increase in the data transferred, particularly information about patient details, preoperative status, anaesthesia and medication details, but no impact on the communication of certain data items and no change in the number of interruptions, irrelevant information, or confusing pieces of information transferred. Following the introduction of guided handovers using a checklist, Petrovic *et al.* (2012) reported a decrease in observed parallel conversations at handover and an increase in the information shared between the OR and a cardiac ICU at a US tertiary centre. The intervention incorporated a comprehensive staff training initiative, but failed to demonstrate a significant decrease in the average number of reported technical defects occurring at handover. Another US study involving training in the use of a standardised handover protocol (Joy *et al.* 2011) showed a significant decrease in the mean number of observed information omissions and technical errors per handover after implementation. Craig *et al.* (2012a) observed handovers at a PICU in the UK following the implementation of a structured handover guideline and found that the completeness of information transferred was improved and there was a reduction in omissions of information. Achaiber *et al.* (2012) also reported improvements in the structure and content of PACU handover at a UK hospital following implementation of a standardised proforma.

Salzwedel *et al.* (2013) reported the outcomes of a randomised controlled trial to test the effectiveness of a standardised checklist for handovers between the OR and PACU; the participants were randomised at post-intervention into those trained in the checklist and those trained in the checklist and supplied with a written copy of it. The results showed a significant increase in the percentage of overall data items handed over in the group that was supplied with the written copy of the checklist, although handovers using the written checklist took significantly longer than those without it and some data items on the checklist were not transferred at handover. In an Australian study to test the effectiveness of a pharmacy-led handover protocol between an oncology and haematology unit and critical care, Coutsouvelis *et al.* (2010) recorded the number of pharmacy interventions per patient handover in which errors or omissions needed to be rectified and reported a significant reduction in the number of interventions per patient transfer.

These various studies indicate the potential for standardised checklists to improve *how* information is transferred between units. However, since each checklist was developed as a bespoke tool to address specific deficiencies in local handover processes, it is difficult to compare findings across studies. Just two studies (Zavalkoff *et al.* 2011; Agarwal *et al.* 2012) evaluated checklists with reference to patient outcomes and they reported a reduction in the number of complications observed per patient after implementation of their checklist to improve handover. Handover

checklists may also aid staff in deciding when to conduct handover; a checklist developed by Sahyoun *et al* (2013) assisted staff in determining when paediatric patients needed to be handed over from ED to ICU, with the tool exhibiting a sensitivity of the communication template in detecting the need for admission at 84 per cent, and specificity at 77 per cent.

Standardised checklists, forms and protocols: Shift handovers

In addition to their role in facilitating between-unit transfers, the literature also indicates that standardised checklists and forms may improve information transfer at shift change. Eight studies were uncovered that examined the use of standardised checklist tools for use during shift handover (Lee *et al.* 1996; Ferran *et al.* 2008; Salerno *et al.* 2009; Stahl *et al.* 2009; Lyons *et al.* 2010; Weiss *et al.* 2013; Sadri *et al.* 2014; Berkenstadt *et al*. 2008). Using a randomised controlled trial design, Weiss *et al*. (2013) tested the effectiveness of a standardised 'cognitive aid' handover form on handover communication between residents on a PICU. The authors reported a positive independent effect of the intervention on their primary outcome measure, an 'information score' based on the amount of relevant clinical information reported. They also reported significantly higher scores among the intervention group on their secondary outcome, an 'educational score' that rated handover on the basis of five critical elements, namely: effective summary of events; expressed understanding of care plan; presentation clarity; organisation; and all over handover effectiveness. However, they observed no change in the time for handover between the intervention and control groups. Lee *et al.* (1996) conducted a small RCT among medical interns on a cardiovascular ward, providing ten interns with a standardised sign-out card to use during shift handover, with nine interns acting as a control. Based on a participant questionnaire administered to rate handover quality and a review of randomly-selected standardised and non-standardised sign-out sheets, the intervention demonstrated improved completeness of data recording among the intervention group, who reported positively on the use of the sign-out card. Berkenstadt *et al*. (2008) evaluated nursing shift handovers on a medical step down unit, following the introduction of a standardised checklist, and reported increased communication of patient physiologic parameters, demographics, and the reason for patient presence in the unit.

A prospective cohort study reported by Stahl *et al.* (2009) indicated that the use of structured checklists may improve the follow-up of tasks handed over at shift change; after introducing the checklist to guide handovers on a surgical and trauma ICU, they demonstrated a significant reduction in the loss of critical laboratory test results in the 24 hours after shift change. Salerno *et al.* (2009) examined the effectiveness a standardised sign out tool for use during handover between day and night teams on a general internal medicine ward; based on user self-reports, they found that day interns believed the handover from night interns had improved significantly, whereas night interns believed that significantly less medication and background history information was omitted, although they did not perceive the handover information to be more accurate. Wayne *et al*. (2008) reported that following the introduction of a new handover template, the found users perceived improvements in the accuracy of handover information; however, issues in the handover process included uncertainty around the point at which responsibility was transferred to the oncoming resident and difficulties around accurately identifying the on-call attending physician.

Three studies reporting the impact of standardised checklists and forms were reports of small pilot studies or audits (Ferran *et al.* 2008; Lyons *et al.* 2010; Sadri *et al.* 2014). Lyons *et al.* (2010) reported improvements in the clinical content communicated at handovers, after implementing a standardised handover form as part of morning handover on a neurology ICU at a UK hospital; however this finding was based on just ten handovers, opportunistically observed before and after the introduction of the intervention over the course of one month. Based on a pilot study conducted among physicians on an orthopaedic unit, Ferran *et al.* (2008) showed an improvement in handover about diagnosis and site of injury and improved overall data transfer, although the handover information of relevant blood results remained poor post the intervention.

Communication in the OR

Several authors have examined the use of checklists, in particular, the WHO surgical safety checklist, to improve patient safety in the OR. Reviewed here are studies which evaluated checklists and standardised forms to improve communications in the OR. Five studies were identified which evaluated the effects of a standardised checklist on pre-operative communications in the OR (Lingard *et al.* 2005; Lingard *et al.* 2008; Kearns *et al.* 2011;Takala *et al.* 2011; Mohammed. *et al.* 2013); two of these were reports of a single project (Lingard *et al.* 2005; Lingard *et al.* 2008). Lingard and colleagues conducted a pilot study over a seven-week period (Lingard *et al.* 2005) followed by a before-and-after intervention study over 13 months (Lingard *et al.* 2008) and observed a significant reduction in the number of overall communication failures and communication failures which could be associated with at least one visible negative consequence. However, the authors were unable to determine which specific elements of the checklist were responsible for the specific communication improvements, i.e., whether the improvements were a function of the team communicating or the specific data items prompted for discussion by the checklist. Takala *et al.* (2011) reported the impact of the WHO surgical checklist on staff perceptions of communication at the ORs of four Finnish hospitals. Following the intervention, confirmation of patient identity in the OR improved and critical events were discussed more often between surgeons and anaesthesiologists. Circulating nurses and anaesthesiologists also reported significantly fewer breakdowns in communication, although surgeons' perceptions of communication did not change.

- Kearns *et al.* (2011) implemented a surgical safety checklist at an obstetric tertiary referral centre in the UK and found that the majority of medical and non-medical staff believed that the checklist could improve communication in the OR.
- Mohammed *et al.* (2013) conducted an audit of caesarean sections performed at an UK hospital before and after the introduction of the WHO obstetric safe surgery checklist. By comparing obstetrician and anaesthetists notes, and the degree of correlation between the grading of C-Section recorded in the notes, they showed that post-checklist, there was increased similarity in the grading. The authors hypothesised that shared clinical awareness of the urgency of caesarean section had improved post-implementation as a result of facilitating improved communication.

Other structured forms

Four studies, all of which used a before-and-after design, reported the impact of introducing a structured daily goals form on which the priority tasks and goals for each patient were recorded, typically as part of morning handover rounds (Pronovost *et al.* 2003; Narasimham *et al.* 2006; Phipps & Thomas, 2007; Agarwal *et al.* 2008). While authors reported improved staff perceptions of team communication (Narasimham *et al.* 2006; Phipps and Thomas, 2007) or their understanding of patient goals (Pronovost *et al.* 2003, Narasimham *et al*. 2006; Agarwal *et al.* 2008), these studies were based on user self-reports and may not reflect an actual improvement in understanding or communication. These studies also measured average length of stay (LOS) for the period before and after implementation of the form; two authors reported a reduction in mean LOS (Pronovost *et al.* 2003; Narasimham *et al.* 2006), and one observed no change in LOS (Agarwal *et al.* 2008).

Table 6 Empirical studies which evaluated checklists or standardised written protocols

Author	Tool	Design	Setting and sample	Context	Outcomes
Achaiber *et al* (2012) (abstract)	Standardised form	Before-and-after	UK: Single site PACU staff (no number reported)	Inter-departmental handover OR to PACU	Improvements in the structure and content.
Agarwal *et al* (2008)	Daily goals sheet	Before-and-after	US: Single site PICU Multidisciplinary staff (no number reported)	Communication during morning handover rounds	Improved understanding of patient care goals among nurses and physicians. No change in LOS.
Agarwal *et al* (2012)	Two step process: (1).Telephone handover using standardised pro forma. (2).Face to face handover using standardised checklist	Before-and-after	US: Single site Paediatric Cardiac ICU (PCICU) Survey respondents before (n=61/89); Survey respondents after (n=114/124) Patients reviewed before (n=700; Patients reviewed after (n= 369)	Inter-departmental handover. OR to PCICU	Improved perceptions of adequate information. communicated at handover. Reduction in the number of complications observed per patient after implementation.
Berkenstadt *et al* (2008)	Standardised checklist Teamwork training in use of checklist	Before-and-after	Israel: Single site Medical step-down unit Nursing staff on a hospital. Handovers before(n=224); Handovers after (n=166)	Shift handover	Increased communication of patient physiologic parameters. Increased communication of demographic information Increased communication of the reason for patient's presence in unit.
Coutsouvelis *et al* (2010)	Standardised checklist	Before-and-after	Single site Oncology and haematology units. Clinical pharmacists, critical care medical staff (no number reported) Handovers before (n=30); Handovers after (n= 22)	Inter-departmental handover OHU to critical care.	Non-significant decrease in median LOS in post-implementation period. Reduction in number of patients requiring a pharmacy intervention to rectify error in the in post-implementation period. Reduction in the average number of errors per patient handover in post-implementation period. Increase in the number of prescribed therapies administered on time.

Table 6 cont. Empirical studies which evaluated checklists or standardised written protocols

Author	Tool	Design	Setting and sample	Context	Outcomes
Craig *et al* (2012a)	Standardised handover form	Before-and-after	UK: Single site PICU Multidisciplinary staff (no number reported) Handovers before (n=21); Handovers after (n=22)	Inter-departmental handover OR to PICU	Reduction in information omitted during handover. Improvements in staff perceptions of readiness for handover, and ability to focus on handover. Reduction in the number of interruptions. No change in the duration of the handover.
Ferran *et al* (2008)	Standardised handover form	Before-and-after.	UK: Single site Trauma and orthopaedic unit On-call physicians Patient handovers forms before ((n=48); Patient handover forms after (n=55)	Shift handover	Increase in the amount of overall data handed over at shift change.
Joy *et al* (2011)	Standardised handover form	Before-and-after.	US: Single site PICU Surgical team members (no number reported) Handovers before (n =41); Handovers after (n=38)	Inter-departmental handover OR to PICU	Reduction in the mean number of omissions per handover event Reduction in the mean number of technical errors per handover event.
Jukkala *et al* (2012)	Somatic communication tool	Before-and-after	UK: Single site MICU Nursing staff (n = 70)	Shift handover	Improved perception of communication during shift report.
Karakaya *et al* (2013)	Standardised checklist	Before-and-after	Belgium: Single site Cardiac PICU Anaesthetists (no number reported) Handovers before (n = 23); Handovers after (n = 25)	Inter-departmental handover OR to PICU	Increase in overall data transfer. Decrease in duration of verbal transfer. No change in number of interruptions, irrelevant information and confusing information. Improvement in median handover assessment score from ICU nursing staff but not medical staff.
Kearns *et al* (2011)	WHO obstetric safe surgery checklist	Before-and-after	UK: Single site Obstetric surgical staff Survey respondents before (n=52); Survey respondents after (n=46)	Communication in the obstetric OR	After, majority of staff felt communication in the OR had improved. After, increase in % of staff who felt familiar with other team members.

Table 6 cont. Empirical studies which evaluated checklists or standardised written protocols

Author	Tool	Design	Setting and sample	Context	Outcomes
Lee *et al* (1996)	Standardised sign-out card	RCT	US: Single site Cardiac ICU (CICU) Medical interns (n=19; 10 intervention; 9 control)	Shift handover	Improvement in data completeness among intervention sign-outs. Positive reaction by interns to the use of the card.
Lingard *et al* (2005)	Standardised checklist	Before-and-after	Canada: Single site Surgical staff (n=33).	Communication in the OR	Staff felt the checklist was not time consuming or difficult to use but may have been difficult to find the right 'timing' in which to go through the checklist. Checklist was not always used consistently.
Lingard *et al*(2008)	Standardised checklist	Before-and-after	Canada: Single site Surgical staff (n=223)	Communication in the OR	Significant decrease in mean communication failures. Decrease in the number of communication failures associated with at least one visible negative consequence.
Lyons *et al*(2010)	Standardised handover protocol	Before-and-after	UK: Single site Neurological ICU NCHDs (no number reported) Handovers reviewed (n=10)	Shift handover	Timing of handover showed no significant difference by location but the timing of gaps between handover significantly different between locations. Clinical content of handover differed between ward and coffee room, and between ward and lecture theatre.
Mohammed *et al* (2012)	WHO obstetric safe surgery checklist.	Before-and-after	UK: Single site Anaesthetists, obstetricians Notes reviewed pre-checklist (n=195); Notes reviewed post-checklist (n=195)	Inter-disciplinary communication in OR	Differences in C-Section grading reduced, and similarity in grading increased in checklist group compared with pre-checklist group. Authors hypothesise shared clinical awareness of urgency of C-Section had improved post-implementation as a result of facilitating improved communication.
Narasimham *et al* (2011)	Daily goals sheet	Before-and-after	US: Single site ICU Nurses, physicians (no number reported)	Handover rounds	Improvement in staff perceptions of team communication. Improvement in staff understanding of goals. Reduction in mean LOS over the course of 9 months compared with 9 months for same period of previous year.

Table 6 cont. Empirical studies which evaluated checklists or standardised written protocols

Author	Tool	Design	Setting and sample	Context	Outcomes
Petrovic *et al* (2012)	Standardised handover protocol	(pilot) Before-and-after	US: Single site Cardiac Surgery ICU (CSICU) Multidisciplinary CSICU and OR staff (no number reported)	OR to CSICU	The presence of all team members at bedside during handover increased. The sharing of information increased.
Phipps *et al* (2007)	Daily goals sheet	Before-and-after	US: Single site PICU Nursing staff (n = 40)	Handover rounds	Perceived improvement in nurse-physician communication. Perceived improvement in communication between nurses on different shifts.
Pronovost *et al* (2003)	Daily goals sheet	Before-and-after	US: Single site Surgical ICU Nurse practitioners (n=3) and residents (n=6) caring for patients during the study period.	Handover rounds	Improvements in staff understanding of goals over eight week study period. Reduction in mean LOS over the course of a year following implementation.
Sahyoun *et al* (2013)	Standardised checklist	Post-implementation review	US: Single site ED Registered nurses, emergency medical technicians Patient handovers (n=285)	Inter-departmental handover ED to ICU	Sensitivity of the communication template in detecting the need for admission to an ICU was 84%, the negative predictive value (NPV) was 95%, the specificity was 77%, and the positive predictive value (PPV) was 50%.
Salerno *et al* (2009)	Standardised checklist	Before-and-after	US: Single site General internal medicine Interns (n=34)	Shift handover (day to night)	Improvement in perception of sign-out by both night and day interns. Night interns perceived there was less data omitted at sign-out but not that sign-out was more accurate. Day interns perceived less frequency of dropped tasks post-implementation. No change in satisfaction with sign-out at post-implementation.
Salzwedel *et al* (2013)	Standardised checklist	Before-and-after. RCT.	Germany: Single site PACU Anaesthesiology residents (n=80; 40 intervention; 40 control)	Inter-departmental handover OR to PACU	Increase in % of data items communicated when physical checklist used compared to group who were just aware of data items to communicate. Increase in handover duration with use of checklist than without.

Table 6 cont. Empirical studies which evaluated checklists or standardised written protocols

Author	Tool	Design	Setting and sample	Context	Outcomes
Stahl *et al(2009)*	Standardised checklist	Before-and-after	US: Single site Trauma and surgical ICU Clinical teams (interns, residents, fellows, attending trauma surgeon) Patient days observed (n=332)	Shift handover	Laboratory follow-up items significantly less likely to be lost when checklist was used.
Takala *et al* (2011)	Standardised checklist	Before-and-after	Finland: Four sites Surgical staff Survey respondents before (n=901); Survey respondents after (n=847)	Communication in the OR	Improved communication of patient identity. Increase in the discussion of critical events between surgeons and anaesthesiologists. Reduction in perceived communication breakdowns between circulating nurses and anaesthesiologists. No change in surgeons' perceptions of communication.
Zavalkoff *et al* (2011)	Standardised checklist	Before-and-after	Canada: Single site Cardiac PICU Surgical staff (n=33)	Inter-departmental handover OR to PICU	Improvements in completeness of data handed over. No change in handover duration.
Wayne *et al.* (2008)	Standardised handover form	Before-and-after	US: Single site 12 surgical services Multi-disciplinary staff: Nurses (n=40) Residents (n=187)	Shift handover	Improvement in perceived accuracy of handover information.
Weiss *et al*(203)	Cognitive aid (structured form with prompts to present rationale)	RCT	Canada: Single site PICU 1st and 2nd year residents (n=13; 7 intervention; 6 control)	Shift handover	Increased information transmitted at handover among intervention group. Intervention group handovers ranked higher on organisation, presentation and efficiency.

4.9.3 Performance standardisation using protocols

Nine studies were identified, which developed and implemented a new multi-component handover protocol (Aase *et al.* 2011; Catchpole *et al*. 2013; Starmer *et al.* 2013; Dingley et *al*. 2008; Johnson *et al.* 2011; Vergales *et al.* 2014; Olm-Shipman *et al*. 2011; Okafor *et al.* 2013; Sadri *et al.* 2014). The protocols set out principles and practices for the way handover should be conducted. Catchpole *et al.* (2013) designed a new protocol to improve handover between OR and ICU and evaluated its effectiveness using a before-and-after intervention design. The protocol specified several rules of procedure for conducting a handover, including having one key individual with overall responsibility for handover, dividing the handover into distinct phases, allocating tasks to specific people and using a checklist. Although a small-scale study involving just 50 handovers, the authors reported a reduction in the observed mean technical errors and omissions per handover. The protocol, referred to as the Great Ormond Street Hospital (GOSH) protocol, was subsequently implemented at a hospital in Sweden by Pappilia *et al* (2013), with reported positive preliminary results. Starmer *et al.* (2013) reported the development of a new shift handover protocol for medical interns and residents on two paediatric units; the protocol comprised five elements: teamwork training; the introduction of the SIGNOUT mnemonic to structure verbal handover; the use of a quiet location; periodic handover oversight by a chief resident or attending physician; and restructuring resident and intern handovers so that they occurred as team rather than individual handover. The authors demonstrated significant reductions in the rate of medical errors per admission and data omissions from residents' sign-out sheet, as determined by a review of incident and written handover reports. Despite moving the location of handoffs, however, there was no decrease in the number of interruptions observed per handoff session. These studies provide evidence of how a multifaceted approach to handover improvements can be associated with reduced error and omission, although the differentiated effect of any one element of the protocol is difficult to determine.

Aase *et al.* (2011) developed a handover protocol for use between ambulance and ED staff; the protocol set out the purpose of the handover, the scope, the patient information to be recorded and the responsibilities for staff groups involved. A follow up evaluation of the protocol in use revealed that after two years the protocol was difficult to implement due to time constraints experienced by ED staff and the fact that there were many other protocols to follow. Despite the protocol containing a prompt for active listening, ambulance staff reported that they still needed to 'push' essential information onto the nurses who often did not have time to receive the information. The authors concluded that new handover protocols need to be designed carefully in order to overcome long-standing 'habits' of professional interactions and to resolve long-standing disparities in perceptions and expectations between different staff groups. They also recommended the use of pocket cards to enable ED nurses to access the protocol more readily.

Other reported changes to handover and communication processes have contributed to increased satisfaction and improved perceptions of communication events (Dingley *et al*, 2008; Vergales *et al*. 2014; Johnson *et al*. 2013; Olm-Shipman *et al*. 2011) and reductions in errors (Johnson *et al*. 2013; Okafor *et al*. 2013). Dingley *et al.* (2008) implemented training in use of SBAR, team 'huddles', multidisciplinary rounds (MDR) using daily goals sheets, and concurrent development of an escalation protocol; after implementation of the changes at a US medical centre, they observed that less time was spent on resolving communication issues and reported an increase in nurses' overall positive perceptions of communication events. Vergales *et al*. (2014) also implemented team 'huddles' to improve handover from OR to PICU, along with restrictions in the number of staff involved, mapping out roles and positions during handover, and implementing a handover summary document. Following a post-implementation audit, they reported that the majority of staff felt the new process had improved the quality of care. Following the introduction of a new handover process at a US hospital ED department, Okafor *et al*. (2013) reported a reduction in the number of errors made during hand over of care; the new process comprised: a group sign-out in a designated location; a 'data resident' with responsibility for reviewing all

orders, vital signs, and lab and radiology results on each patient's EMR; and an interruption manager responsible for handling any interruptions during sign-out report. Olm-Shipman *et al*. (2011) observed improvements in the handoff process at a neuroscience ICU after changing the handover process by defining team member roles, structuring the handoff sequence, and highlighting the key information to be communicated. Johnson *et al*. (2013) developed a new protocol for inter-departmental communication between laboratory staff and ED clinicians in response to a patient incident; the process comprised: a requirement for direct communication between the two professionals involved; installation of ED tracker and wireless phone technology to permit laboratory staff to rapidly identify the responsible clinician for each patient; and a change to terminology used to code contaminated specimens on the EMR. In the protocol review period the authors reported no adverse events related to contaminated samples, and improved physician satisfaction with the process of receiving test results.

Although providing limited details on how handovers were assessed, Sadri *et al.* (2014) demonstrated a positive effect of introducing a standardised handover proforma, based on guidance from the RCSE on shift handover at a plastic surgery referral centre in the UK. The handover form used was the 'ABCD' of handover: Admissions (Patients admitted on the preceding shift), Bosses (contact details for responsible consultants), Casualty (Patients waiting to be admitted from ED), Deteriorating (ward patients)), and included requirements for the handover to be supervised by the senior registrar on call, conducted in a non-clinical setting, instigate a no bleeps policy, discuss all patients admitted during the take, all patient information to be present, and handover to occur during working hours. The authors reported an increase in the percentage of handovers which contained complete patient information following the
Introduction of the ABCD form.

Table 7 Empirical studies which evaluated performance standardisation

Author	Tool	Design	Setting and sample	Context	Outcomes
Aase *et al* (2011)	Multi-component process outlining: -Purpose -Scope -Patient information to hand over -Staff responsibilities for handover	Multistage focus group interview design	Norway: Single site ED nurses (n=12), ambulance personnel (n=10)	Inter-departmental handover Ambulance to ED	Ambulance staff felt nurses who many not want to leave a patient they are attending in order to receive handover of another. Nurses reported time constraints as a barrier to consistently using the protocol. Long standing relationships and habits are difficult to remove or alter with a protocol.
Catchpole *et al* (2013)	Multi-component process: -Checklist -Safety checks -Facilitating assertiveness -Task allocation -One key individual with responsibility for handover	Before-and-after	UK: Single site PCICU Multidisciplinary staff (no number reported) (n=23 handovers before; n=27 handovers after)	Inter-departmental handover OR to PICU	Reduction in mean technical errors and mean omissions.
Dingley *et al* (2008)	-Training in and use of SBAR -Team "huddles" -Multidisciplinary rounds (MDR) using daily goals sheets -Escalation process tool	Before-and-after	US: Single site MICU and Acute Care Unit (ACU) Multidisciplinary staff across the hospital	Inter- and intra-departmental communication	Less time was spent on communication issue resolution, Increase in surveyed nurses' overall positive perception of communication events.

Table 7 cont. Empirical studies which evaluated performance standardisation

Author	Tool	Design	Setting and sample	Context	Outcomes
Johnson *et al* (2013)	Multi-component process: - Requirement for direct communication. - Installation of ED tracker and wireless phone technology to allow laboratory staff to rapidly identify the responsible clinician for each patient - Change to terminology used to code contaminated specimens on the EMR	Post-implementation review	US: Single site Laboratory staff, ED clinicians (no number reported)	Inter-departmental communication Laboratory and clinical staff	No adverse events related to contaminated samples, Increased physician satisfaction with the process of receiving test results.
Okafor *et al* (2013) (abstract)	Multi-component process: -Group sign-out to occur in a designated location within each care area -"data resident," responsible for reviewing all orders, vital signs, and lab and radiology results on the EMR for each patient -Interruption manager responsible for handling any interruptions	Before-and-after	US: Single site ED EM residents, attending physicians (no number reported)	Shift handover	Reduction in the number of errors made during hand over of care.

Table 7 cont. Empirical studies which evaluated performance standardisation

Author	Tool	Design	Setting and sample	Context	Outcomes
Olm Shipman *et al* (2011) (abstract)	Multi-component process: -Defined team member roles -Structured the handoff sequence -Highlighted key information to be communicated.	Post-implementation audit	US: Single site (n17 handover observations)	Inter-departmental handover OR to neuroscience ICU	Improvement in provision of a one-hour warning notification of handover. Increase in presence of all team members during the handoff. Increase in physician satisfaction.
Sadri *et al* (2014)	Standardised handover protocol :the ABCD of handover -handover to occur in non-clinical environment -Supervised by a senior registrar on call -All patients admitted during the take are discussed -All patient information should be present -No bleeps during handover -Handover to happen during working hours,	Before-and-after	UK: Single site plastic surgery referral unit Multidisciplinary staff (no number reported)	Shift handover	Increase in presence of senior clinician at handover. Increase in complete patient information handed over.
Starmer *et al* (2013)	-SIGNOUT, -TeamSTEPPS -Relocation -Handover supervision.	Before-and-after	US: Single site Paediatric units Resident physicians (n=84)	Shift handover	Reduction in overall medical error rates per 100 admissions. Reduction in key data omissions. No decrease in number of interruptions.

Table 7 cont. Empirical studies which evaluated performance standardisation

Author	**Tool**	**Design**	**Setting and sample**	**Context**	**Outcomes**
Vergales *et al* (2014)	Multi-component process: -Limiting individuals involved -Mapping out roles and positions -Including a post-operative 'huddle', -Post-surgical summary document	Post-implementation audit	US: Single site OR and PICU Multidisciplinary staff (no number reported) (n=79 consecutive handovers observed)	Inter-departmental handover OR to PICU	Majority if staff felt the process improved the quality of care. High adherence to the process observed.

4.9.4 IT and technological solutions

The majority of studies which discussed electronic tools to support handover and communications were concerned with IT applications used solely for handover. Typically the electronic tools described in the literature involved a structured electronic form with predefined data fields based on a minimum dataset. Some of the tools were integrated with data imported from the electronic medical record (EMR). One study examined how professionals could be supported by the EMR system during handovers (Hertzum and Simonsen, 2008).

Family practice residents surveyed by Ram and Block (1993) suggested that one of the perceived benefits of computerised systems to support communication is improved legibility and consistency, and there is some evidence to suggest that electronic systems may improve the completeness and accuracy of data exchanged at handover. Pickering *et al*. (2009) described a new electronic handover data input form for recording details of past medical history, diagnosis, key physiologic parameters, and treatment goals for the current shift period. The authors reported the impact of the tool on handover following its introduction in the ICU ward of an Irish hospital over a two-week period; based on pre- and post-intervention questionnaires, the authors found a significant improvement in the accuracy of physician recall, as compared to data in the EMR, and improved physician knowledge of the principle and secondary goals for a given patient episode. Ahmed *et al.* (2012) reported the effects of a training intervention for NCHDs in the use of a structured template for use in acute surgical admissions. Developed in accordance with handover guidance from the Royal College of Surgeons of England (RCSE 2007), the intervention resulted in improvements in the observed recording of medical history, demographics and hospital number on admission; however, deficits persisted post-intervention with respect to the recording of history, diagnoses, and record or imaging performed. Raptis *et al.* (2009), who evaluated the impact of a new handover system between day and night staff at a UK hospital, reported a significantly greater number of completed information fields when the electronic handover system was in place. Dubosh *et al.* (2012) found that the introduction of a computerised sign-out checklist among ED medical residents improved the recording of certain data elements, specifically, the history of present illness and likely diagnosis. Graham *et al.* (2013) implemented a structured electronic handover form accompanied with verbal face-to-face handover for handover reports between primary interns and night-time covering interns on a general medical unit. The interns reported a higher quality of verbal and written handoffs, and an objective review of handover content confirmed the improved quality of written handoffs. However the accuracy of the information was not verified and the measure of quality was based on the presence of data only.

The introduction of an electronic system may also improve the efficiency of the handover process, as evidenced in the results of a randomised controlled trial conducted among general surgical and internal medicine residents at two hospitals in the US (Van Eaton *et al.* 2005). The findings indicated that a centralised, Web-accessible sign-out system, UWCores, populated with details from the EMR, reduced the number of reported patients missed by the team per month on handover rounds, reduced the mean time at pre rounds spent copying values from the EMR, and reduced the mean duration of handover rounds.

A small number of studies have evaluated the effectiveness of electronic handover systems on patient outcomes and show equivocal results. Ryan and colleagues (2011) reported an intervention to test a new system of shift handover among surgical staff in an Irish hospital. The intervention involved a standardised template report completed by the senior house officer, emailed to the on-coming team followed by a verbal handover in the morning shift change, and was associated with a reduction in the median length of patient stay for the two week post-intervention period. Graham *et al.* (2013) reported the findings of a systems intervention in which interns were asked to report adverse events, omissions, and near misses related to poor quality handovers, and found no significant reduction in the number of adverse events and a non-significant reduction in near misses.

Petersen *et al.* (1998) used a before-and-after intervention design to evaluate a computerised sign out system on preventable adverse events, but were unable to attribute an observed reduction in the number of preventable events to the intervention due to the small number of outcomes and inadequate power of the study. Van Eaton *et al.* (2010) conducted a retrospective analysis of electronic data collected during a previous RCT study (Van Eaton. *et al.* 2005) and demonstrated that the new system had no negative impact on medical errors, the incidence of medication errors per team or the number of resident-reported incidents. Oroviogoicoechea *et al* (2013) introduced a new electronic tool, a template auto populated with data from the EMR, to improve nursing shift handover at a US hospital, but found no impact on length of stay (LOS). The introduction of a Web-based tool to support sign-out from the ED to inpatient wards by Fischer *et al* (2012) was associated with a reduction in the time from bed assignment to ED departure, but no change in ED LOS.

Several studies reported improvements in staff perceptions and/or satisfaction of handover quality following the introduction of a new electronic system of handover. Using intervention and control groups, Payne *et al.* (2012) evaluated medical residents' perceptions of handover before and after implementing WardManager, an electronic, Web-based application to support structured sign-out. Conducted over a one-month period, residents in both groups were surveyed each morning after handover, and the authors reported a reduction in the number of perceived near misses, an increase in perceived completeness of information recorded, and increased confidence with the received handover among the intervention group. Patel *et al.* (2009) investigated the impact of TraumaPal, a Web-based electronic software programme for sign-out, among NCHDs in the trauma and orthopaedic units at a London hospital, and found that the majority of those surveyed reported an improvement in the quality of information passed over at handover. An added benefit of the programme was the fact that it enabled them to produce monthly reports on patient demographics, injuries and treatment approaches.

The introduction of electronic handover/sign-out systems populated with data from the EMR has resulted in increased satisfaction with handover among physicians (Kochendorfer *et al.* 2010), an overall positive response to the system among nursing staff (Sidlow *et al.* 2006), increased satisfaction and perceived accuracy of the system among neonatal ICU staff (Palma *et al.* 2011), and improved residents' perceptions of ease of use and handover quality (Anderson *et al* 2010). Following the introduction of integrated sign-out notes with the EMR, Bernstein *et al.* (2010) reported increased physician satisfaction with the sign-out process and demonstrated good adoption of an electronic tool, which was sustained over three-year period, indicating its compatibility with existing work processes. Barnes *et al*. (2011) reported multidisciplinary staff satisfaction with a new electronically-supported shift handover system, OpenKIMS, at a tertiary centre in Australia to replace the old method of unstructured and structured written notes. Nurses surveyed by Oroviogoicoechea *et al* (2013) reported that a new electronic tool had a positive effect on communications during shift handover.

Hertzum and Simonsen (2008) described a fully integrated electronic patient record (EPR) system to support handover; consisting of a verbal overview of each patient accompanied by a projected display of the patient record from the EPR, the system could be updated in real time, including through mobile bedside units. Based on a five-day trial to investigate the capacity of the system to support nursing team handover, the authors reported a significant improvement in perceived clarity of the patient plan and treatment among staff and a significant reduction in the mean reported number of missing information per patient, but found no significant change in duration of handover at pre and post intervention.

Other studies have indicated that specific factors may facilitate or limit the uptake and perceived utility of electronic handover tools among staff. In a case study of the development and implementation of an electronic tool to support handover in the internal medicine department of an Australian hospital, Wong *et al*. (2007) reported a discrepancy between handover reported in interviews, which indicated an efficient process and good information exchange, and observed

handovers, in which cultural, environmental and human factors impacted on the effectiveness of the handover process. Authors have highlighted the difficulty in implementing an IT solution when the perceptions and observations of handover process do not necessarily align. For example, Little *et al*. (2009) reported that EM residents tended not to adopt a new electronic handover if they believed their current handover practice was appropriate. Other reported barriers to the adoption of IT solutions include restricted staff access to the electronic information system (Govier *et al*. 2012), limited functionality, such as not having information updated and no facility for sorting patients by attending physician (Rabinovitch *et al.* 2009), and limited portability, as compared with paper notes (Staggers *et al.* 2011). Staggers *et al*. (2011) also reported barriers associated with incomplete records, little flexibility for additional notes, and the fact that the information contained in the printed summary did not match content of verbal handover. While residents surveyed by Ram and Block (1993) reported improved satisfaction with sign-out following the introduction of a new computer-aided sign-out system at two sites in the US, they were dissatisfied with the data entry element and with the fact that information was not always updated.

Based on evaluation studies, some authors have made recommendations concerning the use of electronic systems to support handover. Hertzum and Simonsen (2008) suggest that several key factors contributed to the success of an electronic patient record system incorporated into handover. These are: having well-described workflows with standardised procedures and protocols; having pre-existing patient information from the EPR; having an IT system that enhances rather than replaces the previous way of working, i.e. maintaining the face-to-face element; having an EPR system that is readily accessible through mobile stations which can be transported to the bedside; and having an EPR system developed through a participatory process. Cheah *et al*. (2005) recommended that electronic handover systems should allow for patient lists to be sorted and printing and allow handover information to be entered efficiently. Based on observations of medical and nursing handovers across three sites in the UK, Randell *et al*. (2011) suggest that electronic tools to support shift handover should be designed to facilitate the practical aspects of the handover process, that is, communicating staffing issues and briefings on admission, allowing two-way handover communications in order to permit errors to be corrected and information to be validated, and being flexible enough to allow some professional discretion as to which information should be retrieved and communicated.

Table 8 Empirical studies which evaluated electronic tools

Author	Tool	Design	Setting and sample	Context	Outcomes
Ahmed *et al.* (2012)	Structured handover template on intranet 40 min. educational session	Before-and-after	UK: Single site Acute surgical ward NCHDs (no number reported) (n=37 admissions before; n=155 admissions after)	Shift handover	Improvements in the recording of: medical history, demographics and hospital number although issues still remained in the recording of history, diagnoses, and record or imaging performed.
Anderson *et al. (2010)*	Electronic handoff application integrated with the EHR	Before-and-after	US: Four sites Internal medicine Residents (n=550 handover sheets before; n=413 after)	Shift handover	Improved recording of vital information. Improved perceptions of the ease with which handoff document could be read. Decrease in time spent preparing handoff documents.
Barnes *et al.* (2006)	Electronic application linked to OpenKIMS database.	Before-and-after	Australia: Single site Medical interns and registrars (n=12 survey respondents before; n=13 respondents after)	Shift handover	Majority of staff reported satisfaction with new system of handover with preference for typed rather than written notes.
Bernstein *et al*. (2010)	Electronic handoff template integrated with the EHR	Before-and-after	US: Single site Academic children's hospital Physicians (no number reported)	Shift handover	Increase in staff satisfaction with the sign-out process. Demonstrated good adoption of the tool, which was sustained over three year period, indicating its compatibility with existing work processes.
Campion *et al.* (2010)	Standalone electronic application	Qualitative analysis (Grounded theory approach) of free text entries	US: Single site Resident physicians (n=730 sign-out notes reviewed)	Shift handover	Four data entry techniques appear beneficial for standardising sign out communications: templates, automatic input, structured data capture, and free text.

Table 8 cont. Empirical studies which evaluated electronic tools

Author	Tool	Design	Setting and sample	Context	Outcomes
Clark *et al.* (2011)	Excel document stored on shared drive Requirement for face-to-face verbal handover		US: Single site General surgery Residents, residency faculty, patient care providers, and hospital administration (no number reported)	Shift handover	Majority of documentation was compliant. Adequate sign-out performed by majority of residents.
Dubosh *et al.* (2012) (abstract)	Electronic sign-out checklist	Before-and-after	US: Single site EM and non-EM residents rotating in the ED. (n=115 handovers before; n=72 after)	Shift handover	Improvements in completeness of sign-out information. No reduction in the duration of sign-out per patient.
Fischer C.M *et al.* (2012) (abstract)	Web based patient tracking application	Before-and-after	ED and ICU. Not specified.	Inter-departmental handover. ED to inpatient ward	No change in ED LOS. Decrease in median time from ED departure to bed assignment.
Flanagan *et al.* (2009)	Patient Handoff Tool (PHT), integrated with the EMR.	Post-implementation review	US: Single site Internal medicine Residents, physicians (n=35/42 survey respondents)	Shift handover	Hand off of printed PHT forms is inconvenient PHT needs to be organised by patient location.
Graham *et al.* *(2013)*	Electronic handoff template linked to EHR Requirement of verbal face-to-face handoff	Before-and-after	US: Single site Primary and night-time covering interns (n=39) at a US hospital (n=200 written handoff reviewed)		After implementation, verbal and written handoffs rated higher quality by interns. No reduction in AE. Non-significant reduction in near misses. Quality of written handover content improved post-intervention. Significantly fewer data omissions in post-intervention handoff forms.

Table 8 cont. Empirical studies which evaluated electronic tools

Author	Tool	Design	Setting and sample	Context	Outcomes
Govier *et al.* (2012)	Standalone electronic spreadsheet stored on shared drive	Post-implementation review	UK: Single site Weekend on-call doctors (no number reported)	Week to weekend handover	Good compliance with new system recorded. Some access permission issues reported by weekend team members. The fact that information not always regularly updated was reported as a limitation.
Hertzum *et al.* (2008)	Fully integrated EMR	Before-and-after Five day trial. .	Denmark: Single site Stroke unit Nursing staff (no number reported) (n= 10 handovers reviewed)	Shift handover	No change in handover duration. Improvement in clarity of nursing plan among nursing staff but not nurse leader. Reduction in the mean number of missing data per patient. Reduction in the mean number of messages to pass on per patient. No change in nurses' mental workload during handover.
Kochendorfer *et al.* (2010)	Electronic 'rounding' report integrated with the EMR	Before-and-after	US: Single site Inpatient wards Residents, faculty members (n=53/93 respondents before; n=62/108 respondents after)	Shift handover	Decrease in time spent on pre-rounding i.e. gathering data for the handover report. Increased provider satisfaction with the report. Majority felt rounding report improved patient safety.
Little *et al.* (2009) (abstract)	Electronic application, e-HOT, integrated with EMR	Before-and-after	US: Single site EM Residents (no number reported)	Shift handover	EM residents tended not to adopt a new process of electronic handover, e-HOT, if they believed their current practice of handover was appropriate.
Orov-iogoicoechea *et al.* (2013)	Electronic template integrated with the EMR	Post-implementation review	Spain: Single site Medical and surgical nurses (n=81/121 survey respondents)	Shift handover	Majority of nurses perceived the tool as useful and that it had a positive effect on communication at shift change. The number of words recorded in the free text component of the shift report decreased following introduction of the template.

Table 8 cont. Empirical studies which evaluated electronic tools

Author	Tool	Design	Setting and sample	Context	Outcomes
Palma *et al.* (2011)	Electronic handoff application integrated with the EMR	Before-and-after	US: Single site Neonatal ICU (NICU) Multidisciplinary neonatal care staff (n=52 respondents before; n=46 respondents after)	Shift handover	Increase in provider satisfaction. Increase in perceived accuracy of the information handed over. More time required to update the new system.
Patel *et al.* (2009)	Web based program, TraumaPal	Before-and-after	UK: Single site Trauma and orthopaedic unit NCHDs (n=43)	Shift handover	Majority reported improvements in the quality of information handed over at sign-out.
Payne *et al.* (2012)	Standalone Web based application: WardManager.	Before-and-after	US: Single site Internal medicine 12 resident teams (n=80 respondents before; n=161 after)	Shift handover	Reduction in the perceived number of near misses. Increase in the completeness of information handed over. Increase in reported confidence with the received handover.
Peterson *et al.* (1998)	Electronic handoff template on shared server.	Before-and-after	US: Single site Inpatient wards Physicians (n=99) (n=1874 admissions before; n=3747)	Shift handover	Trend towards reduced number of adverse events among patients in the post-intervention period. Unable to conclude whether the intervention led to a reduction in the number of preventable events.
Pickering *et al.* (2009)	Electronic handover template (printed out for handover)	Before-and-after.	Ireland: Single site ICU Junior and senior staff (no number reported) (n = 137 handovers reviewed)	Shift handover	Improvement in 'clinical intent score' (principal and secondary goals in relation to patient treatment). Improvement in 'handover score' (assessment of accuracy of patient information recall with reference to notes gathered during handover process).

Table 8 cont. Empirical studies which evaluated electronic tools

Author	Tool	Design	Setting and sample	Context	Outcomes
Rabinovitch *et al.* (2009)	Intranet based application integrated with the EMR	(pilot) Before-and-after	Canada: Single site Neurosurgery ward Nurse practitioners (n=25) (n=13 respondents before; n= 20 after)	Shift handover	Poor overall response to the system. Decrease in number of logins to system over the intervention period.
Ram and Block (1993)	Electronic template	Before-and-after	US: Two site Family practice department Residents (n=7)	Shift handover	Increased satisfaction post-implementation. Residents felt that the new system was improved legibility and satisfaction with sign-out. Residents disliked the data entry element such that information was not always updated, and the need to be trained on the new system.
Raptis *et al.* (2009)	Electronic handover template integrated with the EMR.	Before-and-after	UK: Single site Acute hospital Medical interns (no number reported) (n=773 handovers before; n= 872 handovers after)	Day to night shift handover	Greater number of information data fields complete post-intervention.
Ryan *et al.* (2011)	Electronic template filled out by SHO and emailed to on-coming team. Verbal face-to-face handover	Before-and-after	Ireland: Single site Surgical staff (no number reported)	Shift handover	Reduction in median patient LOS in the two week post-intervention period.
Sidlow *et al.* (2006)	Electronic handoff application integrated with the EHR	Post-implementation review	US: Single site General medicine Nursing staff (n = 19/20 survey respondents)	Shift handover	Overall positive response to the new system. Participants felt that the sign-out form should make it clear who the responsible physician for the given patient is.

Table 8 cont. Empirical studies which evaluated electronic tools

Author	Tool	Design	Setting and sample	Context	Outcomes
Staggers *et al.* (2011)	Electronic handoff template integrated with the EHR	Post-implementation review	US: Single site Acute care units Nursing staff (n=26)	Shift handover	Electronic printed summary underutilised by staff Information was felt to be incomplete on some occasions. Summary did not always match the information felt required at handover. Portability of handwritten notes was a benefit Act of writing notes felt to aid cognition.
Stein *et al.* (2010)	Electronic application, integrated with the EMR	Retrospective, descriptive analysis of free text entries	US: Two sites Primary and covering physicians. (~8 months of data from Site A, and ~18 months of data from Site B).	Shift handover	Common terminology and phrases utilised between the two medical centres. Indicate potential for standardised terminology and drop down boxes to be incorporated in electronic system.
Van Eaton *et al. (2010)*	Electronic handoff application integrated with the EHR	RCT Crossover design	US: Two sites Surgical and internal medicine residents (n=161)	Shift handover	No negative impact on medical errors, medication errors, and the number of resident-reported incidents.
Van Eaton *et al. (2005)*	Electronic handoff application integrated with the EHR	RCT Crossover design	US: Two sites Surgical and internal medicine residents (n=161)	Shift handover	Reduced number of reported patient missed out during handover rounds among the intervention group. Reduced time spend pre-handover (copying data from EHR). Reduced handover duration.
Wong *et al.* (2007)	Electronic application: Extracts information from the admin. And pathology system.	Case study	Australia: Single site Internal medicine Clinicians (n=20 interviewed) (n=50 handovers observed)	Shift handover	Discrepancy between handover reported in interviews (efficient process, good information exchange) and observed handovers (cultural, environmental, human factors impacted on the effectiveness of the handover process. Authors highlight the difficulty in implementing an IT solution when the perceptions and observations of handover process do not necessarily align.

4.10 Economic evaluation studies

While no studies were identified that analysed the budgetary impact of clinical handover in maternity services, two studies were identified, which analysed the budget impact of introducing a change to clinical handover practices in acute care settings (Hess *et al.* 2010, Yao *et al*. 2012). Hess *et al.* (2010) used a comparison of the costs of a clinical handover improvement initiative set against the cost of readmission to acute care. The clinical handover improvement initiative involved the addition of verbal telephone reports to supplement written handoffs for patients being discharged from a respiratory acute care unit to a rehabilitation facility. Using a historical control group of patients readmitted to the unit in the previous two years as the comparator, Hess *et al.* (2010) examined the economic impact of the clinical handover improvement initiative on readmission within 72 hours of discharge as the primary end point, with total cost, including readmission cost, being the secondary end point. The authors reported that while there were no differences in readmission rates by demographic variables, admission service, or co-morbidity, they concluded that supplementing a written report with a verbal telephone report was associated with 'a significant reduction in cost', the estimated median total cost of care was significantly less following the introduction of the intervention. Studying 362 patients transferred from acute care, 211 with the supplementary verbal report and 151 as a control, they reported that the odds of hospital readmission if the verbal report was added to handover were significantly reduced, determining that the median total cost of care was significantly less following the introduction of the intervention, $111,723, as compared to $148,574 per patient. The intervention yielded an average saving of circa. $184,000 for every 100 patients discharged from the acute care unit. However, the reduction in readmission rates was not statistically significant.

Yao *et al.* (2012) used a modelled cost-utility analysis to estimate the cost of an educational intervention to improve clinical handover practice aimed at improving clinical handoff at the point of discharge. Using staff education in clinical handoff as a case study to describe a method for prospective evaluation of the cost of a 'generic' health intervention, the authors conducted an economic analysis of the intervention with reference to the cost of adverse events, post-discharge and patient readmission. The intervention involved facilitated classroom instruction supported by a suite of internet materials. The endpoint of the intervention was 'expected monetary benefit', an expression of expected health gain in Quality Adjusted Life Years (QALY), and the comparator was the cost of treating adverse events in the absence of the intervention. The adverse events were derived from the literature, while the estimates of effectiveness were based on expert opinion.

Yao *et al.* (2012) estimated that the intervention would reduce the incidence of adverse events by 21 per cent or a reduction of adverse events for all discharges from 6.3 per cent to 4.7 per cent. Based on estimates for delivering the intervention in the Netherlands, and with reference to patient endpoints, the authors calculated the intervention was 'highly cost-effective at only about €214 per QALY gain'. The authors concluded that, while the magnitude of the expected effects of the proposed intervention was modest, a 1.7 percentage point reduction in all adverse events, the model demonstrated that the effect magnitude would be 'highly cost-effective'.
The modelled cost-utility analysis described by Yao *et al.* (2012) involved a nine-step framework for approaching economic evaluations of generic service delivery interventions. The steps were: determining the endpoints; estimating overall and preventable risks; estimating the expected effectiveness; utility loss due to adverse events; unit costs of the intervention; costs associated with adverse events; calculating the health benefit and cost savings; calculation of cost-effectiveness; and headroom and sensitivity analysis result. The case example in question was HANDOVER, a European Union funded project to develop an educational intervention aimed at improving patient care at the point of discharge from hospital to the community. While the intervention in question was concerned with handover between hospital and primary care, the study is included here on the basis that the framework it provides and the principles of the intervention it examines, may prove beneficial in determining the cost of handover interventions, specifically 'generic'

interventions such as training initiatives, within the acute hospital setting, including the maternity setting.

In addition to the two studies cited, one discussion paper, published by O'Byrne *et al*. (2008) outlined how an economic evaluation of SBAR could be conducted. They suggest that certain elements are required to develop a reliable economic evaluation, namely: 1. timing; 2. perspective, i.e. whether the tool is effective from the perspective of the health system, the staff, and the patient; 3. what measure of effectiveness linked to a patient outcome will be used; and 4. non-health outcomes, i.e. staff satisfaction and relationships.

In summary, just two economic studies were included in the review, one of which was a involved pre-intervention modelled cost analysis (Yao *et al.* 2012). The handover improvement initiatives used were an educational intervention aimed at improving patient care at the point of discharge from hospital to the community (Yao *et al.* 2012) and a verbal telephone report used to supplement the usual written report (Hess *et al.* 2010). The methods used to determine the economic effectiveness of improved handover practices were a modelled cost-utility analysis to study adverse events (Yao *et al.* 2012) and a comparison of costs and readmission rates (Hess *et al.* 2010). The economic benefits of the interventions were found to be effective with reference to patient endpoints, notably readmission rates (Hess *et al.* 2010) and the incidence of adverse events (Yao *et al.* 2012).

Table 9 Economic evaluation studies

Author	Intervention	Method	Comparator	Economic endpoint	Findings
Hess *et al.* (2010)	Verbal telephone reports to supplement written handoff.	Economic impact analysis	Historical cohort of patients readmitted in previous two years	Readmission costs	A significant reduction in cost, with estimated median total cost of care significantly less; average saving of circa. $184,000 for every 100 patients discharged.
Yao *et al.* (2012)	Staff education programme: facilitated classroom instruction supported by a suite of internet materials.	Modelled cost-utility analysis based on literature and expert opinion	Adverse events in the absence of the intervention	Expected monetary benefit: a measure of expected health gain in Quality Adjusted Life Years (QALY)	Highly cost-effective' at only about €214 per Quality Adjusted Life Year (QALY) gain.

5. Discussion and conclusions

5.1 Key findings

Ineffective communication between healthcare professionals has been increasingly recognised as a factor which can contribute to patient safety incidents. A number of studies identified in this review provided evidence for how problems with professional communication can impact on patient care (White *et al.* 2005; Greenberg *et al.* 2007; Kachalia *et al.* 2007; Singh *et al.* 2007; Bongaerts *et al.* 2012; Pezzolesi *et al.* 2010; Rabol *et al.* 2011). This review found that good

communication among healthcare staff is recognised as a core competency by professional regulatory and accreditation bodies, but that the extent to which best practice in communication is outlined appears to vary across disciplines and between regulatory authorities. For example, in their practice standards for radiographers, radiation therapists and sonographers, the Australian Institute of Radiography (AIR 2013), provide highly prescriptive guidance, whereas in the Medical Council (2009) provides minimal guidance in its code of conduct for physicians. Similar variance has been noted with reference to the availability of specific professional guidance on handover (Australian Commission on Safety and Quality in Healthcare, 2011b).

With the growing recognition of the important the role of communication processes in the quality of patient care, there has been a parallel drive to articulate the principles of good handover practice, and provide health professionals with clear guidance on how to conduct handover effectively and safely. This systematic review identified several publications from official bodies in both the UK (British Medical Association, 2004; Royal College of Surgeons in England, 2007) and Australia which offer guidance on the practice of handover; in the case of the latter country, extensive work conducted under the National Clinical Handover Initiative has led to the development of several publications to inform and guide handover practice (NSW Department of Health, 2009, 2010; Australian Commission on Safety and Quality in Health Care, 2011c, 2010b). Informed by this work, the ACSQHC has established clinical handover as one of its ten National Safety and Quality Service Standards (NCSQHC 2012), standards that have informed the development of handover policies at the departments of health in Western (2013) and South Australia (2013a, 2013b). From the various guidance documents, several core principles of good handover practice are evident. Handover should:

- be prioritised by healthcare organisations and their staff;
- be standardised with clear site protocols that encompass regular staff training and stakeholder review;
- be conducted in a suitable location, verbally and face-to-face, if possible, and with documentary support;
- be explicit with regard to task assignment and handover of responsibility for the patient;
- Involve patients, where appropriate, by conducting handover at the bedside.

The growing focus on the need for effective communication and handover is also reflected in the considerable number of published studies, which have examined the handover process and evaluated and tested strategies to improve it. Handover is a complex process, occurring in many different forms and clinical situations (Manser, 2011) and, to some extent, the diverse range of approaches to standardising the process reflect this complexity. Although varied, the literature indicates that the main approaches can be broadly grouped into the following four-part typology: 1. topic standardisation using mnemonics; 2. content standardisation using checklists or structured templates; 3.content standardisation using electronic applications; and 4. performance standardisation using multi-component handover protocols.

Multi-component handover protocols developed to standardise handover were found to include two or more of the following elements:

1. designating a clear leader (Catchpole *et al.* 2013);
2. allocating tasks and mapping out roles (Catchpole *et al.* 2013; Vergales *et al.* 2014);
3. using a checklist or handover summary document (Catchpole *et al.* 2013; Vergales *et al.* 2014; Sadri *et al.* 2014), such as the SIGNOUT mnemonic (Starmer *et al.* 2013) or daily goals sheets completed during MDR (Dingley *et al.* 2008);
4. training in teamwork (Starmer *et al.* 2013);
5. using a designated, quiet location (Starmer *et al.* 2013; Okafor *et al.* 2013; Sadri *et al.* 2014), to include a no bleeps policy (Sadri *et al.* 2014);
6. changing from individual to team handover (Starmer *et al.* 2013);
7. supervision by a senior clinician (Starmer *et al.* 2013; Sadri *et al.* 2014);
8. using team 'huddles'(Dingley *et al.* 2008; Vergales *et al.* 2014).

A common element across the main approaches to handover improvement is standardisation of information content to be handed over; this is generally seen as an appropriate approach given the evidence that health professionals, particularly junior staff (Apker *et al.* 2007; McFetridge *et al.* 2007), may find it difficult to discern the relevant information to hand over in a given scenario (McFetridge *et al.* 2007, Philibert *et al.* 2009). Clinicians may rely on professional judgement concerning the information items to pass on (Wilson *et al.* 2005), and more experienced staff may be better able to prioritise information (McFetridge *et al.* 2007), and deliver a more effective handover as a result (Poot *et al.* 2013). Several studies indicated that the information transferred at handover can be highly variable (Thakore and Morrison, 2001; Carter *et al.* 2009; Evans *et al.* 2010; Bump *et al.* 2011; Maughan *et al.* 2011; Health Foundation, 2011; Ilan *et al.* 2012; Poot *et al.* 2013) and sometimes irrelevant for patient care (Jenkin *et al.* 2007). Accordingly, professionals may benefit from guidance around the key information to be transferred at hand over, either captured by a checklist or structured form, or prompted through the use of a mnemonic. Defining the content to be handed over may also mitigate the risk of 'diagnosis momentum' whereby the clinician handing over overestimates the information and knowledge of the receiving clinician (Riesenberg, 2012; Beach *et al.* 2012) by creating shared expectations and predictability around the information to be communicated (Leonard *et al.* 2004).

Improving information content

This review found that most of the studies reviewed focused on improving handover content, and used this as an evaluation measure; this may reflect the fact that poor information quality is frequently reported as a barrier to good communication (Bomba and Prakash, 2005; Apker *et al.* 2007; Lawrence *et al.* 2008; Smith *et al.* 2008; Siemsen *et al.* 2012). Moreover, it has been suggested that omissions of information at shift handover cause downstream problems (Horwitz *et al.* 2008). The literature indicates that using a mnemonic such as SBAR or ISBAR (Marshall *et al.* 2009; Bavare *et al.* 2013; McCrory *et al.* 2012; Grover & Duggan, 2013; Thompson *et al.* 2013), SIGNOUT (Bump *et al.* 2012) or SNAPPI (Weller *et al.* 2014) can improve the transfer of data items during simulated telephone referrals (Marshall *et al.* 2009), at shift change (Bump *et al.* 2012; Bavare *et al.* 2013; Thompson *et al.* 2013), during handover from OR to PACU (Grover & Duggan, 2013), or during simulated critical events (Weller *et al.* 2014). However, improvements in the transfer of some information elements were not always demonstrated (Joffe *et al.* 2013a; Cunningham *et al.* 2012; Grover and Duggan, 2013) and irrelevant information may still be communicated even with the use of these tools (Joffe *et al.* 2013a). Some studies indicate that using SBAR or ISBAR can improve the overall clarity and quality of communication during telephone referrals (Cunningham *et al.* 2012; Marshall *et al.* 2009) and using SIGNOUT in the context of a multi-component handover protocol was associated with a significant reduction in rates of medical error per admission and data omissions (Starmer *et al.* 2013).

The evidence from the literature indicates that using a checklist or structured form at shift handover (Weiss *et al.* 2013; Lee *et al.* 1996; Berkenstadt *et al.* 2008) or for inter-departmental handover (Zavalkoff *et al.* 2011; Karakaya *et al.* 2013; Petrovic *et al.* 2012; Craig *et al.* 2012a; Salzwedel *et al.* 2013; Coutsouvelis *et al.* 2010) is associated with greater completeness of information transferred and improved clarity and organisation of communication (Weiss *et al.* 2013). These tools have also been associated with reduced omissions and technical errors during inter-departmental handover (Joy *et al.* 2011; Craig *et al.* 2012a; Coutsouvelis *et al.* 2010) and with improvements in the follow-up of tasks at shift change (Stahl *et al.* 2009). However, as was the case with some mnemonics, checklists or structured forms may not guarantee the consistent communication of all data items (Karakaya *et al.* 2013; Ferran *et al.* 2008).

Supporting shift handover through the use of an electronically-generated template (Ahmed *et al.* 2012; Dubosh *et al.* 2012; Payne *et al.* 2012; Pickering *et al.* 2009) or a template integrated with and populated by data from the EMR (Anderson *et al.* 2010; Graham *et al.* 2013) has been associated with improvements in data recording (Anderson *et al.* 2010; Ahmed *et al.* 2012), fewer omissions of data (Graham *et al.* 2013) and improved accuracy of patient information recall

(Pickering *et al.* 2009). However, these tools do not guarantee that all information elements will be handed over (Ahmed *et al.* 2012).

Improving staff satisfaction

The evidence from the literature indicates that use of ISBAR or SBAR improves staff perceptions of handover quality and accuracy (Rudiger-Sturchler *et al.* 2010; Randmaa *et al.* 2014; Haig *et al.* 2006; Ormilon *et al.*2012; Bavare *et al.* 2013; Thompson *et al.* 2011), and that the IMOUTA mnemonic, improves staff sense of preparedness and knowledge for the upcoming shift (Connor *et al.* 2013). Checklists used in the OR have also been associated with improvements in staff perceptions of communication quality (Takala *et al.* 2011; Kearns *et al.* 2011), and several multi-component approaches to handover improvement have been associated with increased staff satisfaction (Dingley *et al*, 2008; Vergales *et al*. 2014; Johnson *et al*, 2013; Olm-Shipman *et al*. 2011). A number of studies also indicate staff satisfaction with electronic tools integrated with the EMR (Palma *et al.* 2011; Kochendorfer *et al.* 2010; Sidlow *et al.* 2006; Anderson *et al.* 2010; Bernstein *et al.* 2010) and with standalone electronic applications or templates (Barnes *et al.* 2011;Payne *et al.* 2012; Patel *et al.* 2009) to support shift handover. Structured daily goals forms have been associated with satisfaction and improved shared goal understanding (Phipps and Thomas, 2007; Pronovost *et al.* 2003; Narasimham *et al.* 2006; Agarwal *et al.* 2008). While staff satisfaction does not measure effectiveness in key patient outcomes or the content and quality of information transferred, it can possibly improve staff uptake and use of handover tools.

Improving efficiency of the handover process

A number of studies have demonstrated improved efficiency of the handover process, using time taken to complete handover and information content as an outcome measures. For example, using SBAR to structure shift report has been associated with improvements in the efficiency of the process, mainly by reducing the time to hand over each patient (Sohi *et al.*2011; Cornell *et al.* 2013) and allowing more time to be spent on other tasks at shift change (Cornell *et al.* 2013). Using the ABC-SBAR tool resulted in less time elapsed before essential content was communicated (McCrory *et al.* 2012) and other mnemonics has also been associated with shorter handover duration (Iedema *et al.* 2012; Rudiger-Sturchler *et al.* 2010). Electronically-generated templates integrated with the EMR have also been associated with reduced time spent preparing for shift handover (Kochendorfer *et al.* 2010; Anderson *et al.* 2010; Van Eaton *et al.* 2005).

While a number of studies reported no change in handover duration following implementation of a checklist or structured written template (Craig. *et al.* 2012a; Zavalkoff *et al.* 2011), one RCT study demonstrated that using a checklist can significantly increase the time taken for handover (Salzwedel *et al.* 2013).

Improving patient outcomes

Although improving the outcomes of care is a key drivers of handover improvement initiatives, there is limited evidence to demonstrate that changes in the handover process impact on patient outcomes. The use of SBAR has been associated with reduced incident reports (Randmaa *et al.* 2014), reduced likelihood of readmission (Townsend-Gervis *et al.* 2014) and, when used by nursing staff to communicate about deteriorating patients, a decrease in unexpected deaths and increased transfers to ICU (De Meester *et al.* 2013). However, no association could be demonstrated between use of SBAR and LOS (Cornell *et al.* 2014). Checklists for inter-departmental handover have been associated with a reduction in the number of complications observed per patient (Agarwal *et al.* 2012), but with no demonstrable impact on LOS (Coutsouvelis *et al.* 2008). Additionally, no association could be demonstrated between the introduction of electronic tools to support shift handover and a reduction in adverse events (Graham *et al.* (2013), preventable patient events (Petersen *et al.* (1998) or LOS (Oroviogoicoechea *et al.* 2013); however, introducing

a structured template e-mail system for shift handover was associated with reduced LOS (Ryan *et al.* 2011).

5.2 Key considerations for handover improvements

While studies indicate that the various approaches to standardisation of the handover process have potential to increase the effectiveness of handover, particularly in terms of information transfer, the literature also identified a number of key barriers and enablers of professional communication, which should be taken into account when seeking to improve the process within healthcare organisations. Additionally, a key principle to emerge from the literature on handover improvement initiatives was that of 'flexible standardisation', the idea that effective handover involves local interpretation of a standard in order to accommodate contextual factors (Australian Healthcare and Hospitals Association, 2009; Australian Commission on Safety and Quality in Health Care, 2013). This principle is particularly relevant to inter-departmental handovers. The literature suggests that handovers occurring between units should be approached somewhat differently to intra-departmental handovers, including shift change handover, since they require a greater degree of negotiation and collaboration between specialities and professions, whose priorities and information requirements can differ greatly (Beach *et al.* 2012; Hilligoss and Cohen, 2013). These differences were most evident in studies which examined handover between ambulance personnel and ED (Bost *et al.* 2012), ED and inpatient wards (Apker *et al.* 2007; Horwitz *et al.* 2009), OR and PACU (Smith *et al.* 2008), and hand over to ICU (Li *et al.* 2011). In addition to diverse demands for information among different specialities, intra-departmental handovers also involve ambiguity as to the point at which responsibility for the patient transfers.

Several publications have suggested the key data items to hand over in various handover scenarios, including ED to ICU (McFetridge *et al.* 2007), within the ED (Klim *et al.* 2013), during transfer from critical care to hospital ward (National Institute for Health and Care Excellence, 2007) and during shift handover (Solet *et al.* 2006; Bump *et al.* 2011; British Medical Association, 2004; Royal College of Surgeons of England, 2007; Royal College of Paediatrics and Child Health, 2005). Given that professionals may differ in their views regarding the key information to communicate (Siddiqui *et al.* 2012), reaching agreement between departments may prove challenging. Handover content needs to be relevant to the clinical context and handover scenario and determined by the clinical leaders (SA Department of Health (2013a).

It has been proposed that between-unit handovers can act as a point of verification of data (Wilson. *et al.* 2005; Smith. *et al.* 2008; Manser, 2011) and a platform for discussion and shared clinical decision-making (Kerr, 2002; Wilson *et al.* 2005). However, some authors have reported staff ambiguity with regard to transfer of responsibility for the patient at handover (Chin *et al.* 2012; Philibert *et al.* 2009; Wayne *et al.* 2008). The reported 'blurring' of responsibility suggests that both the information content and the point at which responsibility for the patient is transferred should be standardised. This will require the departments involved to determine locally when this will occur and how it will be clearly documented during handover (Smith *et al.* 2008). Even in the case of shift change, approaches to handover standardisation may also need to be developed at the unit or ward level in order to generate clarity around responsibility transfer.

Flexible standardisation may also extend to developing a process, which accommodates the additional purposes of handover. The literature suggests that shift handover is an opportunity to spot error and verify information (Randell *et al.* 2011; Perry *et al.* 2008; Edozien, 2011), train junior members of staff (Royal College of Physicians & Royal College of Nursing, 2012), and discuss operational issues (Edozien, 2011; Randell *et al.* 2011; Farhan *et al.* 2010). In order to facilitate these aspects, shift handover needs to be flexible enough to allow professional discretion in relation to the information to be prioritised during the exchange, and it is important that when standardising tools such as ISBAR or checklists are employed, they do not detract from these aspects of handover (Pillow, *et al*; Cohen and Hilligoss, 2010; Cheung *et al.* 2010). Even when standardised tools are employed, they may not meet the needs on clinicians. For example,

there is evidence that the ISBAR tool might be 'less flexible' and 'less useful' for certain types of handovers (Thompson *et al.* 2011) and, while the SBAR or ISBAR may be appropriate for rapid-response communications, they may be less suitable for shift handover, as the mnemonic does not accommodate additional information elements needed during this type of handover (Pillow 2007). With this in mind, a standardising tool which captures these additional elements may be more appropriate, for example, SIGNOUT (Bump *et al.* 2013; Starmer *et al.* 2012; Horwitz *et al.* 2007; Horwitz *et al.* 2012), IMOUTA (Connor *et al.* 2013), or 'the ABC of handover' (Farhan *et al.* 2010), tools developed specifically to address these missing elements. Some authors have suggested that mnemonics such as SBAR and ISBAR may be more appropriate for one-way communication (Eggins and Slade 2012; Cohen and Hilligoss 2010). Consideration is needed as to how mnemonics can be adapted during inter-departmental handover to invite questions from staff.

Even if a protocol or handover tool accommodates questions and information verification, the literature suggests that approaches to improving handover cannot involve simply content or process standardisation, but must also extend to system-wide changes, including cultivating a working environment where staff feel they can offer their opinions and question information (Reader *et al.* 2007; Health Foundation study, 2011). There is evidence that communication between professionals tends towards information-giving rather than information-seeking, with limited opportunities for questions (Greenstein *et al.* 2011; Apker *et al.* 2007; Welsh *et al.* 2010). There is also evidence that different professional groups differ in their willingness to engage in handover communication as a two way process (Randell *et al.* 2012), and their engagement depends on their role as sender or receiver (Reader *et al.* 2007) or their level of experience and relative position within professional hierarchies (Sharit *et al.* 2008; Carroll *et al.* 2012; Reader *et al.* 2007).

Success in introducing a new handover tool or protocol is influenced by several factors, including long-standing professional relationships and staff 'habits' (Aase *et al.* 2011*)* as well as staff reluctance to make recommendations at handover (Burton *et al.* 2010; Andreoli *et al.* 2010). Selective or partial adaptation of a tool can also impact on its successful introduction; for example, nurses may use the assessment and recommendation elements of SBAR less frequently than medical residents (Goff *et al.* 2014). Staff may report background (Ilan *et al.* 2012, Poot *et al.* 2013) and subjective (Ilan *et al.* 2012) elements only at handover, rather than recommendations (Ilan *et al.* 2012, Poot *et al.* 2013) or plan (Ilan *et al.* 2012) elements, out of deference to the oncoming physician (Ilan *et al.* 2012, Poot *et al.* 2013).

These findings suggest the need for staff consultation to determine how tools, such as mnemonics, can best fit with their existing work processes and professional relationships. Establishing a standardised language and format for inter-professional communication is just one aspect of handover improvement. Training in handover protocols should also extend to encouraging staff assertiveness (Leonard *et al.* 2004; Brindley and Reynolds, 2011) and fostering mutual respect between professionals (Siemsen *et al.* 2012), so that staff hierarchies and professionals relationships do not impede the successful adoption of a new handover process. In a large hospital setting, professionals may lack clarity about each other's role (Siemsen *et al*. 2012 McFetridge *et al*.) and trust and familiarity between professionals may influence their perception of the reliability of the handover data transmitted (Carroll *et al.* 2012; Bost *et al.* 2012). This suggest that inclusion of the 'identify' element of ISBAR may encourage staff to identify themselves and their professional roles at the beginning of handover communication.

Providing a suitable environment in which effective handover can take place is widely regarded as a critical element in any handover improvement and this must be achieved at level of the organisation. The literature indicates that communication processes in the hospital setting are frequently interrupted (Coiera and Tombs, 1998; Lawrence *et al.* 2008; Sharit *et al.* 2008; Welsh *et al.* 2010; Aase *et al.* 2011; McSweeney *et al.* 2011; Bost *et al.* 2012; Poot *et al.* 2013) and that minimising interruptions can improve perceptions of the quality of handover (Klim *et al.* 2013; Sharit *et al.* 2008; Poot *et al.* 2013). Published guidelines stipulate that handover should be

conducted in the best available environment, in which information is readily available (British Medical Association, 2004; Department of Health (Western Australia), 2013). Guidelines also suggest that handover should include the patient and/or carer where possible (SA Health, 2013a, 2013b; Australian Commission on Safety and Quality in Health Care, 2012; Department of Health (Western Australia), 2013).

Physicians have reported that when handover occurs at the bedside, important visual cues and context may add to the quality of communications (Sharit *et al.* 2008). While bedside handover may keep the patient informed and allow information to be further verified or questioned (Australian Commission on Safety and Quality in Health Care, 2010), the practice has been primarily advocated with reference to nursing shift handover (Cincinnati Children's Hospital Medical Center 2013; Queensland Health 2013; Agency for Healthcare Research and Quality 2013; Australian Commission on Safety and Quality in Health Care 2010). Best practice principles suggest that professional judgement, including having due regard to patient privacy and confidentiality, is needed when deciding the information appropriate to hand over in the patient's presence (Australian Commission on Safety and Quality in Health Care, 2010).

Providing staff with access to readily available and up-to-date information will also need to be supported by wider organisational changes – the failure of healthcare organisations in this respect is reported as a barrier to effective handover (Siemsen *et al.* 2012; Grobman *et al.* 2011). Reported issues with electronic tools to support handover include access permissions (Govier *et al.* 2012), limited portability options (Staggers *et al.* 2011), failure to populate with up to date information (Rabinovitch *et al.* 2009; Staggers *et al.* 2011; Wilson *et al.* 2005; Govier *et al.* 2012), limited flexibility around sorting and arranging the information (Rabinovitch *et al.* 2009) or limited flexibility around adding notes (Staggers *et al.* 2011). Additionally, if staff believe their current handover practice to be adequate they may not adopt electronic tools (Little *et al.* 2009). Electronic tools to support handover cannot be successful in improving handover if these issues are not addressed. For electronic tools to work effectively in supporting handover, well described workflows with standardised procedures and protocols need to be in place, along with an effective IT system, including the possibility of mobile stations which can be transported to the bedside in order to increase access (Hertzum and Simonsen, 2008). Furthermore, these tools need to be developed through a participatory process with users, and aim to support, not replace, good handover practice, including face-to-face communications and discussion between professionals (Thomas *et al.* 2009).

5.3 Strengths and limits of the evidence base

This review identified a lack of high quality research evidence from which to draw conclusions regarding the effectiveness of handover tools and processes. The diversity of research methods and designs used to evaluate these tools and the wide variety of handover settings and handover types create further difficulty when attempting to consolidate the findings of research. These issues have been noted by previous authors (Cohen & Hilligoss, 2010; Riesenberg, 2010; Abraham *et al.* 2014; Robertson *et al.* 2014). However, the evidence base is rapidly expanding. Over half of the articles (194/341, 57%) identified through the search for this current review were published in 2010 after. Further systematic reviews (Wibrandt *et al.* 2014; Smeulers *et al.* 2012) and trials (Merten *et al.* 2011) on the topic are currently ongoing.

Study designs

Seventeen systematic reviews were identified, of which eight were rated for quality using the SIGN checklist (Arora *et al.* 2009; Riesenberg *et al.* 2009a; Riesenberg *et al.* 2009b; Riesenberg. *et al.* 2010; Flemming and Hubner, 2013; Russ *et al.* 2013; Abraham *et al.* 2014; Robertson *et al.* 2014), and which add to the strength of the conclusions derived from this current review. A number of RCT studies were also identified which tested the effectiveness of various tools,

including mnemonics in isolation (Marshall *et al.* 2009; Cunningham *et al.* 2012; Joffe *et al.* 2013a) or coupled with feedback from senior clinicians (Bump *et al.* 2012), checklists or structured forms (Lee *et al.* 1996; Weiss *et al.* 2013; Salzwedel *et al.* 2013), and electronic applications to support handover (Van Eaton *et al.* 2005; Van Eaton *et al.* 2010). The quality of four of these RCTs were rated as acceptable using the SIGN checklist for RCTs (Marshall *et al.* 2009; Cunningham *et al.* 2012; Weiss *et al.* 2013; Salzwedel *et al.* 2013) which also adds to the strength of the evidence base.

These strengths notwithstanding, the evidence on handover must be interpreted with some caution. Five RCTs were rated as unacceptable quality using the SIGN checklist, and deemed likely to contain bias (Joffe *et al.* 2013a; Bump *et al.* 2012; Lee *et al.* 1996; Van Eaton *et al.* 2005), largely owing to poor reporting on randomisation, allocation concealment and blinding. For example, in the study by Bump *et al.* (2012), the faculty members evaluating handover were not blinded to whether residents were in the intervention or control group.

Even in those RCTs judged to be of acceptable quality, there is a risk of bias since it cannot be stated with certainty that the findings would not differ if the studies were repeated. For example, in a number of these studies, there may have been selection bias (Marshall *et al.* 2009) and assessors were inadequately blinded (Salzwedel *et al.* 2013; Marshall *et al.* 2009; Cunningham *et al.* 2012). It is acknowledged that, unlike clinical RCTs, it is difficult to secure blinding and concealment when evaluating interventions aimed at altering existing work processes and behaviours.

The remaining studies, which evaluated handover tools and processes, used before-and-after designs, for the most part, and these designs are considered to be less rigorous than the RCT. Many of these studies were small in scale and scope, with few participants, short or ill-defined follow-up periods, or involving observations of very few handover events. For example, several studies examined less than 50 handovers before and after implementation (Coutsouvelis *et al.* 2010; Dharmadasa *et al.* 2013; Farhan *et al.* 2010; Shaughnessy *et al.* 2013; Talbot and Bleetman, 2007; Craig. *et al.* 2012a; Ferran *et al.* 2008; Joy *et al.* 2011; Karakaya *et al.* 2013; Lyons *et al.* 2010). Some studies also reported using convenience samples of handovers, which may have not been representative (Coutsouvelis *et al.* 2010; Talbot and Bleetman, 2007). A number of studies were remarkably small, for example, assessing just ten handovers (Lyons *et al.* 2010; Talbot and Bleetman, 2007) or failed to report the sample size used (Sadri *et al.* 2014).

Most of studies reviewed were conducted in a hospital setting and, for this reason, several current changes may have intervened to cause an impact on the findings. For example, O'Connor *et al.* (2013), who evaluated the IMOUTA mnemonic, reported that participating medical residents were responsible for a greater number of patients and performed more procedures in the pre-intervention phase, as compared with the period following the intervention; hence, beyond the use of the mnemonic, this could have impacted on the self-reported improved satisfaction with handover.

Outcomes

Information transfer was the main outcome measure for the majority of studies (Talbot and Bleetman 2007; Ferran *et al.* 2008; Marshall *et al.* 2009; Stahl *et al.* 2009; Coutsouvelis *et al.* 2010; Farhan *et al.* 2010; Rudiger-Sturchler *et al.* 2010; Joy *et al.* 2011; Thompson *et al.* 2011; Zavalkoff *et al.* 2011; Ahmed *et al.* 2012; Iedema *et al.* 2012; Moseley *et al.* 2012; Petrovic *et al.* 2012; Catchpole *et al.* 2013; Grover and Duggan, 2013; Joffe *et al.* 2013a; Karakaya *et al.* 2013; Salzwedel *et al.* 2013; Starmer *et al.* 2013; Weiss *et al.* 2013; Sadri *et al.* 2014; Albert *et al.* 2012; Bump *et al.* 2012; Dharmasada *et al.* 2013; Weller *et al.* 2014; Berkenstadt *et al.* 2008; Lee *et al.* 1996; Lyons *et al.* 2010; Dubosh *et al.* 2012; Anderson *et al.* 2010; Payne *et al.* 2012; Pickering *et al.* 2009). In several studies, handovers were assessed by a single observer, which could have introduced a degree of bias into the assessments (Joy *et al.* 2011; Karakaya *et al.* 2013; Zavalkoff *et al.* 2011; Dharmadasa *et al.* 2013). Moreover, studies assessed whether certain data items

were communicated, but did not assess the *accuracy* of the information transferred, which may be considered a limited assessment of handover quality. Nevertheless, the study reported by Weiss *et al.* (2013) is noteworthy for the robustness of the evaluation methods used. The evaluator who assessed audio-taped handovers was blinded to the allocation, and the scoring system used was assessed and validated by external evaluators, thereby increasing the reliability of the assessments and thus the validity of the findings.

Few of the studies reviewed examined the effectiveness of a handover improvement initiative on patient-related outcomes (Agarwal *et al.* 2012; Narasimham *et al.* 2011; Pronovost *et al.* 2003; Fischer C.M *et al.* 2012; Graham *et al.* 2013; Peterson *et al.* 1998; Ryan *et al.* 2011; Van Eaton *et al.* 2010; De Meester *et al.* 2013). It cannot be assumed that an improvement in content transfer will lead to improvements in patient care; hence the difficulty in demonstrating a robust link between information transfer and patient outcomes, such as adverse events or incidents, is acknowledged. These patient outcomes occur at relatively low frequency and in order to generate sufficient statistical power to demonstrate an association would necessarily require a much larger study, conducted over a longer time period. Such a study would be costly and, given the complexity of the hospital setting and the associated risk of variables intervening, might not be feasible.

Staff satisfaction and perceptions of quality were the next most-frequently reported outcome measure (Staggers *et al.* 2011; Sidlow *et al.* 2006; Ram and Block, 1993; Payne *et al.* 2012; Oroviogoicoechea *et al.* 2013; Kochendorfer *et al.* 2010; Anderson *et al.* 2010; Bernstein *et al.* 2010; Barnes *et al.* 2006;Vergales *et al.* 2014; Olm Shipman *et al.* 2011; Dingley *et al.* 2008; Johnson *et al.* 2011; Takala *et al.* 2011; Salerno *et al.* 2009; Phipps *et al.* 2007; Kearns *et al.* 2011; Jukkala *et al.* 2012; Agarwal *et al.* 2012; Craig *et al.* 2012a; Connor *et al.* 2013; Thompson *et al.* 2013; Mardegan *et al.* 2013;Velji *et al.* 2008; Randmaa *et al.* 2014; Ormilon *et al.* 2012; Moseley *et al.* 2012; Albert *et al.* 2012; Beckett *et al.* 2009; Jindal *et al.* 2013; Manias *et al.* 2011). While staff opinion is invaluable in determining how well tools and processes work in practice, reliance on subjective measures of handover quality does not offer the best evidence of effectiveness, as this measure may be subject to recall bias and influenced by other factors like staff relationships. For example, in the study reported by Rudiger-Sturchler *et al.* (2010) staff were asked to report on missing or inaccurate handover information; it cannot be assumed that they did so.

Generalisability

All but nine of the studies reviewed (Randmaa *et al* 2014; Vardaman *et al.* 2012; Iedema *et al* 2012; Talbot and Bleetman, 2007; Tapia *et al.* 2013; Weller *et al* 2014; Anderson *et al.* 2010; Stein *et al* 2010; Van Eaton *et al.* 2010) were conducted at a single hospital site, often in a single clinical unit or ward, which limits the generalisability of their findings beyond the immediate context in which they were conducted. The majority of studies evaluating the effectiveness of tools were conducted in general inpatient or internal medicine wards (McCrory *et al.* 2012; Salerno *et al.* 2009; Cornell *et al.* 2013, 2014; Cunningham *et al.* 2012; Vardaman *et al.* 2012; Bump *et al.* 2012; Shaughnessy *et al.* 2013; Anderson *et al.* 2010; Flanagan *et al.* 2009; Kochendorfer *et al.* 2010; Sidlow *et al.* 2006), the ICU, PICU or PACU (Dingley *et al.* 2008; Abraham *et al.* 2013; Albert *et al.* 2012; Bavare *et al.* 2009; Argarwal *et al.* 2008; Achaiber *et al.* 2012;Jukkala *et al.* 2012; Lee *et al.* 1996; Lyons *et al.* 2010; Narasimham *et al.* 2011; Weiss *et al.* 2013; Gerard, 2011; Moseley *et al.* 2012; Randmaa *et al.* 2014; Palma *et al.* 2011; Payne *et al.* 2012; Pickering *et al.* 2009), ED (Farhan *et al.* 2010;Gopwani *et al.* 2013; Iedema *et al.* 2012; Talbot and Bleetman, 2007; Dubosh *et al.* 2012; Okafor *et al.* 2013), or focused on handovers between the OR and PACU or ICU (Joy. *et al.* 2011; Zavalkoff. *et al.* 2011; Craig *et al.* 2012a; Petrovic. *et al.* 2012; Smischney. *et al.* 2012; Karakaya. *et al.* 2013; Salzwedel. *et al.* 2013; Grover and Duggan, 2013; Vergales *et al.* 2014). In terms of the aim of this current review, few reported studies were conducted in a maternity setting (Kearns *et al.* 2011; Dharmadasa *et al.* 2013; Manias *et al.* 2011; Jindal *et al.* 2013; Beckett *et al.* 2009; Mohammed *et al.* 2012), and many that were involved reports of pilot studies (Hatten-Masterson and Griffiths, 2009; Owen and Candelier, 2010; Ottewill *et al.* 2007; Basu *et al.* 2011).

Many studies evaluated locally-developed protocols and tools, and this aspect of study design further limits the generalisability of results to other settings. Additionally, the RCTs which evaluated SBAR or ISBAR were conducted in a simulated environments (Marshall *et al.* 2009; Joffe *et al.* 2013a; Cunningham *et al.* 2012), which may also limit their transferability to real-world clinical settings and handover contexts. Most of the RCTs were conducted among trainee staff, and it may be the case that inexperienced staff gain more from training in a standardised method of handover than their more experienced counterparts. For example, given their junior status, participants in the Weiss *et al.* study (2013) may have benefited more from the cognitive aid which prompted them to present the rationale for information handed over. That is, the effects as reported in these studies among trainees may not be observed among more experienced staff.

5.4 Limitations of the current review

Although a comprehensive search was conducted, the possibility that the reviewers failed to identify all relevant articles cannot be excluded. This review was limited to English language publications and, as such, may not have included the full range of available literature on the subject of clinical handover and communication. Since the vast majority of the studies identified were conducted in the UK, Ireland, Australia and the United States, restricting the search by language may have excluded relevant studies reported in other languages and this may have introduced a degree of bias. This limitation was somewhat counteracted by the use of a broad search strategy and inclusion criteria, along with a grey literature search, which led to the inclusion of additional data. Several systematic reviews on the topic were identified and hand searches of the reference lists of these reviews and other included publications were also conducted, increasing our confidence that all relevant items on the subject were identified.

5.5 Strengths and limitations of sampling in the survey (Evidence from expert opinion)

In addition to published evidence from the systematic review of literature, the evidence base for these guidelines also included information derived from expert opinion, elicited through a process of stakeholder consultation (See Annex 6). This process provided evidence of current clinical handover practices and was based on a national postal survey of all maternity hospitals and co-located maternity units, key informant consultation through focus groups and interviews and non-participant observation of clinical handover practices in the maternity services. The key informants consulted included chief executive officers of maternity services, medical staff, midwifery staff, pharmacists, radiologists, pathologists, health and social care professionals and service users. The process of stakeholder consultation was an important element in ensuring that the guidelines were developed with reference to current practices in Ireland, including good practices.

The national survey element yielded a high response rate, with16 out of the 19 services returning a completed questionnaire, thereby providing evidence of current practices in the majority of the maternity services. However, the small sample size was an inherent constraint, since it was not possible to examine statistically service variables that might impact on the way that clinical handover is conducted. Hence it was only possible to examine and report on simple frequency distributions from the survey data.

5.6 Conclusions

Based on a systematic review of the available literature it is not possible to conclude that any one method of standardising handover will improve patient outcomes. Although there is some indication that standardised handover methods improve information transfer, this does not guarantee the accuracy of that information, only that certain data items were or were not transferred. Standardising the process may be associated with gains in handover efficiency, and increased staff satisfaction, but equally, asking staff to utilise additional tools can also impact on

handover effectiveness, including duration. As such it is important to consider how well these tools fit with existing processes; auditing their use to confirm that they do not hinder existing workflows would address this question.
It is likely that handover improvement initiatives will not only need to standardise the process and the content of handover, but will also have to address wider issues which impact on the effectiveness of handover and communication, including, *inter alia*, existing staff hierarchies and professional relationships. Other recommended strategies include encouraging staff assertiveness and relocating handover to an environment which better facilitates the process, and which may permit involvement of patients and relatives. The idea of 'flexible standardisation', which allows handover guidance protocols to be interpreted locally, will also need to be considered. This is of particular relevance when standardising inter-departmental handovers, as clinical departments may have different priorities, in terms of the information to be communicated at handover, and different perceptions with regard to the point at which responsibility for the patient is transferred.

In conclusion, all site handover protocols should be developed in consultation with staff to ensure that changes to handover practice fit with existing work processes and accommodate the needs of different professions and disciplines. In order to determine whether staff feel fully able to utilise standardised tools, it will be necessary to ascertain their training and professional development needs in that regard.

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Annex 1 (Literature Review Section)

Table 1. List of regulatory and professional bodies	
Ireland	
Health Information and Quality Authority	http://www.hiqa.ie/
The Irish Nursing and Midwifery Board	http://www.nursingboard.ie/en/homepage.aspx
Health Service Executive, Office of Nursing and Midwifery	http://www.hse.ie/eng/about/Who/ONMSD/
Medical Council	https://www.medicalcouncil.ie/
Royal College of Physicians in Ireland	https://www.rcpi.ie/
The Institute of Obstetricians and Gynaecologists	https://www.rcpi.ie/landing.php?locID=1.5.71
The College of Anaesthetists of Ireland	https://www.anaesthesia.ie/
The Royal College of Surgeons of Ireland	http://www.rcsi.ie/
The Department of Health	http://www. health.gov.ie/
The Pre Hospital Emergency Care Council	http://www.phecit.ie/Default.aspx
Patient Safety Initiative	http://www.patientsafetyfirst.ie/
Health and Social Care Professionals Council	http://www.coru.ie/
European and International	
European Midwives Association	http://www.europeanmidwives.org/index.php
iOECD library	http://www.oecd-ilibrary.org/
Europa	http://europa.eu/
International Federation of Gynaecology and Obstetrics	http://www.figo.org/
United Kingdom	
Health and Care Professions Council	http://www.hcpc-uk.org/publications/
The Nursing and Midwifery Council	http://www.nmc-uk.org/
Patient Safety Initiative	http://www.patientsafetyfirst.ie/
National Institute for Clinical Excellence	http://www.nice.org.uk/
Centre for Maternal and Child Enquiries UK/Ireland	http://nagp.ie/archive/centre-for-maternal-and-child-enquiries-cmace-ireland
National Patient Safety Authority	http://www.nrls.npsa.nhs.uk/about-us/
The West Midlands Perinatal Institute	http://www.perinatal.nhs.uk/rpn/index.htm
Health Foundation	http://www.health.org.uk/
British Medical Association	http://bma.org.uk/
General Medical Council	http://www.gmc-uk.org/index.asp
NHS Institute for Innovation and Improvement	http://www.institute.nhs.uk/
Royal College of Obstetricians and Gynaecologists	http://www.rcog.org.uk/
The Royal College of Midwives	http://www.rcm.org.uk/
The Royal College of Physicians	http://www.rcplondon.ac.uk/
Royal College of Paediatrics and Child Health	http://www.rcpch.ac.uk/
Royal College of Radiologists	https://www.rcr.ac.uk/
Royal College of Anaesthetists	http://www.rcoa.ac.uk/
Royal College of Physicians of London	http://www.rcplondon.ac.uk/
Royal College of Surgeons of Edinburgh	http://www.rcsed.ac.uk/
Royal College of Physicians of Edinburgh	http://www.rcpe.ac.uk/
Australia	
Australian Department of Health	http://www.health.gov.au/

Centre for Health Communication	http://www.centreforhealthcom.org/
Nursing and Midwifery Board of Australia	http://www.nursingmidwiferyboard.gov.au
Australian College of Midwives	https://www.midwives.org.au/
Australian Medical Association	https://ama.com.au/
Australian Commission on Safety and Quality in Health Care	http://www.safetyandquality.gov.au/
Australian Patient Safety Foundation	http://www.apsf.net.au/index.php
Royal Australian and New Zealand College of Obstetricians and Gynaecologists	http://www.ranzcog.edu.au/index.php
Australian Resource Centre for Healthcare Innovations	http://www.archi.net.au/
Australian Patient Safety Foundation	www.apsf.net.au
Clinical Excellence Commission	http://www.cec.health.nsw.gov.au/
American Medical Association	http://www.ama-assn.org/ama
National Health and Medical Research Council	https://www.nhmrc.gov.au/
Medical Board of Australia	http://www.medicalboard.gov.au/
Australian Institute of Radiography	http://www.air.asn.au/pubpols.php
Australian Nurse and midwifery accreditation council	http://www.anmc.org.au/
NSW Agency for Clinical Innovation	http://www.aci.health.nsw.gov.au/
Queensland Health	http://www.health.qld.gov.au/
Victorian Quality Council	http://www.health.vic.gov.au/qualitycouncil/
New Zealand	
College of Midwives	http://www.midwife.org.nz/
Royal Australasian College of Physicians	http://www.racp.edu.au/
Health Quality and Safety Commission New Zealand	http://www.hqsc.govt.nz/
United States	
Joint Commission on Accreditation of Healthcare Organisations	http://www.jointcommission.org/
Agency for Healthcare Research and Quality	http://www.ahrq.gov/index.html
Institute of Medicine	http://www.iom.edu/
American Congress of Obstetricians and Gynaecologists	https://www.acog.org/
The Institute for Healthcare Improvement	http://www.ihi.org/Pages/default.aspx
National quality forum	http://www.qualityforum.org/Home.aspx
Institute for Healthcare Communication	http://healthcarecomm.org/

Annex 2 (Literature Section)

PubMed Search Strategy

ID	Search criteria	Hits
1	Hand-over* OR Handover* OR Hand-off* OR Handoff*	1646
2	Patient Handover* OR Patient Handoff* OR Clinical Handover* OR Clinical Handoff* OR Shift Handover* OR Shift Handoff* OR Handover Tool* OR Hand-off Tool* OR Handover Improvement* OR Handoff Improvement* OR Improving Handover* OR Improving Handoff*	367
3	"Patient Handoff"	193
4	1 OR 3	1708
5	Shift change OR Change-of-shift OR End-of-shift OR Shift report* OR Inter-shift OR Intershift OR Sign-out	749
6	4 OR 5	2343
7	Communication Tool* OR Communication Practice* OR Communication Standard* OR Communication Method* OR (Communication AND Tool*) OR Communication Tool*	1616
8	Improving Communication* OR Communication Improvement* OR (Communication AND Improving) OR (Communication AND Improve*)	1751
9	Communication Failure* OR (Fail* and Communicat*) OR Communication Breakdown* OR Poor Communication* OR Ineffective Communication* OR Inadequate Communication*	1791
10	Or / 7-9	5005
11	Inter-professional Communication* OR Interprofessional Communication* OR Intra-professional Communication*OR Intraprofessional Communication* OR Inter-departmental Communication* OR Interdepartmental Communication* OR Intra-departmental Communication* OR intradepartmental Communication* OR Inter-disciplinary Communication*OR Interdisciplinary Communication* OR Multi-disciplinary Communication* OR Multidisciplinary Communication*	604
12	"Interdisciplinary Communication"	3864
13	11 OR 12	4413
14	10 or 13	9276
15	6 OR 10 OR 13	11469
16	Physician* OR Doctor* OR Clinician* OR Nurse* OR Nursing OR Resident* OR Medical Personnel OR Health Personnel OR Hospital staff OR Medical Staff or Medical Professional* OR Health Professional* OR Healthcare Professional* OR Healthcare Provider*	866977
17	"Health Personnel"	351700
18	16 OR 17	1067882
19	"Hospitals, General" OR "Hospitals, Private" OR "Hospitals, Public" OR "Hospitals, Teaching" OR "Tertiary Care Centers" OR "Secondary Care Centers" OR "Hospitals, Urban"	88137

20	General Hospital OR General Hospitals OR Private Hospital OR Private Hospitals OR Teaching Hospital OR Teaching Hospitals or Urban Hospital OR Urban Hospitals OR Acute Hospital OR Acute Hospitals OR Acute Service* OR Acute Care Facility OR Acute Care Facilities OR Tertiary Hospital OR Tertiary Hospitals OR Secondary Hospital OR Secondary Hospitals OR Secondary Care Center* OR Secondary Care Centre* OR Secondary Referral Hospital OR Secondary Referral Hospitals OR Secondary Referral Center* OR Secondary Referral Centre* OR Secondary Care Facility OR Secondary Care Facilities OR Tertiary Hospital OR Tertiary Hospitals OR Tertiary Care Center* OR Tertiary Care Centre* OR Tertiary Teferral Center* OR Tertiary Referral Centre* OR Tertiary Care Facility OR Tertiary Care Facilities	81506
21	19 OR 20	151219
22	Maternity Hospital OR Maternity Hospitals OR Maternity Service* OR Maternity Unit* OR Maternity Ward* OR Labour Ward* OR Labor Ward* OR Delivery Room* OR Delivery Suite* OR Delivery Unit* OR Obstetric*	66978
23	"Hospitals, Maternity"	2043
24	22 OR 23	67910
25	15 AND 24	140
26	Limit 25 to English and 1990-01-01 to current (2014-03-31)	128
27	6 AND 19	208
28	14 AND 18 AND 21	280
29	27 or 28	469
30	Limit 29 to English and 1990-01-01 to current (2014-03-31)	419
31	ISBAR OR SBAR	104
32	Standardised Communication*OR Standardized Communication* OR Standardising Communication* OR Standardizing Communication* OR Structuring Communication* OR Structured Communication*	358
33	31 OR 32	448
34	Limit 33 to English and 1990-01-01 to current (2014-03-31)	383
35	2 OR 26 OR 30 OR 34	1190
36	Limit 2 to English and 1990-01-01 to current (2014-03-31)	356

Economic MEDLINE Search Strategy

ID	Search criteria	Hits
1	((hand?over or hand?off) adj3 (patient$ or clinical or shift or tool$ or improve$ or improving)).tw.	370
2	Exp Patient Handoff/	209
3	(shift change or change-of-shift or end-of-shift or shift report$ or shift-to-shift or inter?shift or sign?out$).tw.	1012
4	Or /1-3	1443
5	(communication adj2 (improve$ or improving or tool$)).tw.	5613
6	(physician$ or doctor$ or clinician$ or nurs$ or resident$ or medical personnel or health personnel or hospital staff or medical staff or medical professional$ or health professional$ or healthcare professional$ or healthcare provider$).tw.	907034
7	Exp health care personnel/	369175
8	6 or 7	1118436
9	Exp Hospital/	202897

10	(general hospital or general hospitals or private hospital or private hospitals or teaching hospital or teaching hospitals or urban hospital or urban hospitals).tw	64611
11	tertiary adj1 (hospital or hospitals or care centre$ or care center$ or referral centre$ or referral center$ or care facility or care facility).tw.	17487
12	secondary adj1 (hospital or hospitals or care centre$ or care center$ or referral centre$ or referral center$ or care facility or care facilities).tw.	563
13	acute adj1 (hospital or hospitals or service$ or care facility or care facilities).tw.	3884
14	Or/9-13	266011
15	Exp Hospitals, Maternity/	2095
16	maternity adj2 (hospital or hospitals or service$ or unit$ or ward$).tw	7162
17	(labo?r ward$ or delivery room$ or delivery suite$ or delivery unit$ or obstetric$). tw.	74415
18	Or/15-17	80895
19	14 or 18	339815
20	5 and 8 and 19	346
21	((inter?professional or intra?professional or inter?departmental or intra?departmental or inter?disciplinary or multi?disciplinary) adj2 communication$).tw.	637
22	* interdisciplinary communication/	3931
23	21 or 23	4504
24	23 and 8 and 19	207
25	4 or 20 or 24	1969
26	((standardi#ed or structuring or structured or standardi#ing or standardi#ation) adj2 communication$).ti,ab.	293

Economic filter		
ID	**Search criteria**	**Hits**
27	Economics/	26882
28	"cost and cost analysis"/	41641
29	Cost allocation/	1941
30	Cost-benefit analysis/	59819
31	Cost control/	20184
32	Cost savings/	8701
33	Cost sharing/	1930
34	"deductibles and coinsurance"/	1421
35	Medical savings accounts/	481
36	Health care costs/	26971
37	Direct service costs/	1026
38	Drug costs/	12114
39	Employer health costs/	1066
40	Hospital costs/	7723
41	Health expenditures/	13634
42	Capital expenditures/	1942
43	Value of life/	5898
44	Exp economics, hospital/	19428
45	Exp economics, medical/	13551
46	Economics, nursing/	3899
47	Economics, pharmaceutical/	2532

48	Exp "fees and charges"/	26973
49	Exp budgets/	12057
50	(low adj cost).mp	25007
51	(high adj cost).mp	8116
52	(health?care adj cost$).mp	4492
53	(fiscal or funding or financial or finance).tw.	83171
54	(cost adj estimate$).mp	1455
55	(cost adj variable$).mp	33
56	(unit adj cost$).mp	1581
57	(economic$ or pharmaeconomic$ or price$ or pricing).tw.	177261
58	Or/27-57	464534

ID	Search criteria	Hits
Concept	(Handover OR Communication improvement OR Communication between professionals) AND economic filter	
59	25 and 58	73
Concept	All results no limits, no duplicates	
60	Remove duplicates	40

ID	Search criteria	Hits
Concept	(Standardising Communication) AND economic filter	
61	26 and 58	14
Concept	All results no limits, no duplicates	
62	Remove duplicates	14

Annex 3 (Literature Review Section)

SBAR

SBAR is a situation briefing model developed by the United States Navy and originally developed for healthcare by Michael Leonard, MD, Physician Leader for Patient Safety, along with colleagues Doug Bonacum and Suzanne Graham at Kaiser Permanente with a view to improving communication and patient safety in the context of perinatal care (http://www.ihi.org/resources/pages/tools/sbartechniqueforcommunicationasituationalbriefingmodel.aspx). SBAR serves as a mechanism to structure conversations, in particular, critical communications. As outlined in the OSSIE Guide to Clinical Handover Improvement (Australian Commission on Safety and Quality in Healthcare, 2010b) the acronym refers to: Situation, a report on the current issue, Background, on the clinical background to the problem, Assessment, a presentation of the current problem, and Request or Recommendation, a suggestion on what should be done or requested to be done for the patient. While the mnemonic can be used in many varying healthcare communication scenarios, it is typically adapted for use in the specific environment, by including prompts of specific information under each of the four data elements (Haig *et al.* 2006). An example, obtained from the NHS Institute for Innovation and Improvement is shown below.

Situation	• Identify yourself the site/unit you are calling from Identify the patient by name and the reason for your report Describe your concern
Background	• Give the patient's reason for admission • Explain significant medical history • You then inform the consultant of the patient's background: admitting diagnosis, date of admission, prior procedures, current medications, allergies, pertinent laboratory results and other relevant diagnostic results. For this, you need to have collected information from the patient's chart, flow sheets and progress notes
Assessment	• Vital signs • Contraction pattern • Clinical impressions, concerns
Recommendation	• Explain what you need – be specific about request and time frame • Make suggestions • Clarify expectations

ISBAR

ISBAR originates from SBAR and was developed for use as part of an Australian National Clinical Handover Initiative project led by Hunter New England Area Health Service (Aldrich R, Duggan A *et al.* 2009). It additionally includes the Identify data element to ensure that the relevant clinicians and patient are identified as part of the communication. As outlined in the HSE acute medicine programme (http://www.hse.ie/eng/about/Who/clinical/natclinprog/acutemedicineprogramme/earlywarningscore/isbarchart.pdf) , the mnemonic refers to: Identify, confirming your identity, the identity of the required clinician and reporting the identity of the patient in question, Situation, reporting the current situation, and the reason for communication, Background, reporting relevant medical history and background for the patient, Assessment, a report on what you feel is the problem, Recommendation, what you feel the receiving clinician

should do. An example of how ISBAR may be adapted for use on an obstetric unit is obtained from the South Australia Department of Health, is shown below.

Identify	• Patient's MRN, Name and DOB • Name and title/role of staff handing over • Operation and date (e.g. Vag hyste + A/P repair)
Situation	• Reason for admission (e.g. Hyperemesis @12 weeks) • Diagnosis if known (e.g. Active stage of labour) • Mode of delivery and date (e.g. LSCS for CTG changes)
Background	• Relevant previous history (e.g. Elective LSCS for breech, allergic to penicillin, any social issues of note)
Assessment	• Latest clinical assessment, clinical and investigations (e.g. VE: 4 cm ROT -1 at7.30 ,Urine output, Labs, Hb ,B/P, pulse, temperature and respirations, pain score, patient anxiety)
Recommen-dation	• Actions required after handover (e.g. Call surgeon for urgent consult –specify level of urgency with timeframe; "Dr Jones to discuss situation with patient and partner at 10:00am") • Risks (e.g. eclampsia) • Assign individual responsibility for conducting any task

ISoBAR

ISoBAR was originally developed as part of collaboration handover improvement project led by the Western Australian Country Health Service (WACHS) and Royal Perth Hospital (Porteous *et al.* 2009) for use in the communication relating to inter-hospital transfer whereby communication occurred by telephone, supplemented by written documentation. As outlined in the OSSIE Guide to Clinical Handover Improvement(Australian Commission on Safety and Quality in Healthcare, 2010b) the mnemonic refers to: Identification, a report on three key identifiers: Name, DOB, and Medical record number to ensure patients are correctly identified, Situation and Status, a report on the patient's current status, that is, whether they are improving or deteriorating, Observation, the incoming team are informed of latest observations, Background and history, the incoming team are informed of the background to the patient's situation including the present problems, underlying issues, diagnosis, and whether current management is working, Assessment and actions, this aims to ensure all pending results or unusual findings are conveyed to the oncoming team, actions that still remain to be completed, and a plan for escalation and communication of the case to higher level of care, Responsibility and risk management, responsibility for the patient must be transferred to oncoming team, by way of signing relevant paperwork, that is, handover reports, and by closing the communication loop, carrying out read-back of core information. Observation was included as a separate element to distinguish between 'old' or inaccurate information that was frequently found to be handed over under Situation. Data communicated under Observation is intended to prompt a call or trigger for emergency assistance.

SBAR-R / ISBAR-R

As part of the Quality and Safety Education for Nurses (QSEN) project, a variation of SBAR and ISBAR, which includes an additional R for Read back has been implemented in the curriculum at the University of Pittsburgh Medical Center Shadyside School of Nursing (http://qsen.org/reformulating-sbar-to-i-sbar-r/) and at the University of Akron, Ohio (Enlow *et al.* 2010). The latter

provide the template below as an example of how the mnemonic may be used to prepare report prior to calling a physician.

Identify	• Name, title and unit
Situation	• The patient you calling about and the room number • The reason you are calling
Background	• Admission diagnosis and admission date • State pertinent medical history • Brief synopsis of treatment if pertinent
Assessment	• Most recent vital signs • Changes in vital signs or assessment from prior assessment
Recommen-dation	• Report what you think would be helpful or needs to be done (e.g. medications, treatments, tests, X-rays, EKG, CT, transfer to critical care, physician evaluation, consultant evaluation) • Ask about any changes in orders
Read Back	• Restate the orders you have given • Clarify how often to do vital signs • Under what circumstances to call back

SHARED

The SHARED mnemonic, was developed as part of a Australian Clinical Handover Initiative project conducted at the Mater Hospital (Hatten-Mastersonand Griffiths, 2009) to improve communication between Visiting Medical Officers (VMO) and midwives, specifically to ensure clinical information is handed over at crucial time-points: 1. Referral to the VMO from midwife following a change in woman's condition and, 2. Referral from VMO to recovery nurse/midwife post-Caesarean. As outlined in the OSSIE Guide to Clinical Handover Improvement (Australian Commission on Safety and Quality in Healthcare, 2010b) the mnemonic refers to: Situation, a report on the reason for patient admission, or for the phone call, History, a report on the details of recent treatment and actions along with medical history, Assessment, a reports on any recent results obtained, and an assessment of the severity of the situation, Risk, a report on any specific risks associated with the case; i.e., allergies, risk of infection, any susceptibility to certain incidents, falls for example, Expectation, a report on the expected plan for care, and patient outcomes, and Documentation, a report on any relevant documents, progress notes, details of a care path, and medical record.

IMIST-AMBO

The mnemonic IMIST-AMBO is commonly used in the context of handover from ambulance personnel to ED staff and was originally developed by Jacinta Young, to improve handover from paramedics in the Northern regions of New South Wales (NSW) (Iedema and Ball, 2010). The MIST model, incorporated in the IMIST AMBO protocol, was originally developed from a model, by Professor Tim Hodgetts in the UK, for use in South Africa (Talbot and Bleetman, 2007). The IMIST AMBO mnemonic may be used in conjunction with ISBAR as outlined in a toolkit developed by the ARCHI (2013a). As outlined by Iedema and Ball (2012), the mnemonic refers to: Identification of the patient, Mechanism of injury/illness, Injuries sustained or suspected, Signs, vitals and GCS,

Treatment given and trends/response to treatment, Allergies, Medications, Background history, and Other (social) information.

SOAP

The SOAP note was originally used as a generic tool for coordinating patient-care delivery and management process in the Medical ICU (MICU), allowing clinicians to standardise entries to the medical record in a problem-based format, that is, recording data about the health status of a patient in a problem-solving system. The mnemonic reminds clinicians to document a patient's Subjective symptoms and complaints, Objective physical findings and test results, as well as their Assessment and management Plan.

ISHAPED

The ISHAPED mnemonic was originally developed by Friesen *et al.* (2013) as part of the Picker Institute Always Events initiative, with the aim of improving the experiences of patients and families and making care more patient-centred.

Annex 4 (Literature Review Section)

Table 1. Teamwork and communication training resources

Name	Organisation	Description	Source
SBAR training and competency assessment	Institute for Healthcare Improvement (IHI)		http://www.ihi.org/resources/pages/tools/sbartrainingscenariosandcompetencyassessment.aspx
TEAMStepps	Agency for Healthcare Research and Quality (AHRQ)	Teamwork training programme for healthcare professional	http://www.safetyandquality.gov.au/wp-content/uploads/2012/03/TeamSTEPPS-Implementation-of-a-teamwork-programme-into-an-Australian-Setting-Public-Report-on-Pilot-Study.pdf http://teamstepps.ahrq.gov/
Managing Obstetrical Risk Efficiently	Salus Global	A patient safety improvement and professional development programme for individuals working in birthing units	http://www.moreob.com/
Structured Multidisciplinary Intershift Handover (SMITH)	Edozien *et al*	Protocol for pre-handover, handover, and post-handover in maternity care	(Edozien, 2011)
Structuring Communication for Interprofessional Collaboration (SCRIPT)	Canadian Inter-professional Health Collaborative	Professional development program for improving collaboration between team members	http://www.cihc.ca/regional/overview/ontariolist/script (Zwarenstein *et al.* 2010)
Handover, Enabling Learning in Communication for safety (HELiCS)	Centre for Health Communication	Handover observation video-reflexive method	(Iedema and Merrick 2009) http://centreforhealthcom.org/helics/
The PACT program: Communication training and team training to support handover	Australian Commission on Safety and Quality in Healthcare	• Guidance on using the SBAR tool • Handover prompt cards	http://www.safetyandquality.gov.au/implementation-toolkit-resource-portal/interface/additional-clinical-handover-resources/national-clinical-handover-initiative-pilot-program/albury-wodonga-private-hospital.html
MeL- Maternity e-learning program	Maternity Services Education programme	Communication between midwife and consultant obstetrician Communicating key clinical issues using ISBAR	http://www.mel-training.com.au/ (Bulle, Ford *et al.* 2011)
Clinical Handover tool "Know the Plan, Share the Plan, Review the Risk"	South Australia Department of Health	Film for use in handover education and training	http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/clinical+resources/safety+and+quality/clinical+handover/clinical+handover+tool+know+the+plan+share+the+plan+review+the+risk

Table 1. cont. Teamwork and communication training resources			
Name	**Organisation**	**Description**	**Source**
OSHE	Arora et al	Interactive, objective, structured handoff experience for undergraduate medical students	http://virtualmentor.ama-assn.org//2012/05/medu1-1205.html http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3409830/

Table 2. Patient safety and communication improvement initiatives

Name	Organisation	Description	Source
European Handover Initiative		Collaborative research program to improve continuity of care during handover, with a focus on handover between primary and secondary services	http://www.handover.eu/index.html
Australian National Clinical Handover Initiative	Australian Commission on Safety and Quality in Healthcare (ACSQHC)	Clinical handover improvement programme to develop best practice in communications, educational materials and communication tools for use in handover scenarios	http://www.safetyandquality.gov.au/our-work/clinical-communications/clinical-handover/national-clinical-handover-initiative-pilot-program/
Communicating for clinical care (Closed)	Clinical Excellence Commission	Aims to source existing teaching tools in communication and develop additional material and tools, and to test the tools at a range of demonstration sites in NSW. Based on successes trialling the tools and supporting materials, develop additional tools in consultation with Area Health Service (AHS) representatives, and roll this education program out across NSW Health.	http://www.cec.health.nsw.gov.au/concluded-programs/clinical-care#resources2

Table 2. cont. Patient safety and communication improvement initiatives

Name	**Organisation**	**Description**	**Source**
Transforming Care at Bedside	Robert Wood Johnson Foundation and IHI	Launched in 2003, Transforming Care at the Bedside (TCAB) is a national program of the Robert Wood Johnson Foundation (RWJF) and the Institute for Healthcare Improvement (IHI) that engages leaders at all levels of the healthcare organisation to: Improve the quality and safety of patient care on medical and surgical units; increase the vitality and retention of nurses; engage and improve the patient's and family members' experience of care; and improve the effectiveness of the entire care team	http://www.ihi.org/Engage/Initiatives/Completed/TCAB/Pages/default.aspx (Lee *et al.* 2008)
Safer Births	Kings Fund	Project to develop guidance and resources to improve safety in maternity care	http://www.kingsfund.org.uk/projects/safer-births
Hospital at Night	National Patient Safety Agency (NPSA)	Improvement program to address the change in shift work patterns, and improve the delivery of out of hours care	http://www.nrls.npsa.nhs.uk/resources/?EntryId45=59820
Safer Clinical Systems	Health Foundation	Safety improvement program. Phase II focuses on clinical handovers and prescribing	http://www.health.org.uk/areas-of-work/programmes/safer-clinical-systems/
Patient Safety First	National Patient Safety Agency, Health Foundation The NHS Institute for Innovation and Improvement	A campaign to promote and support the implementation of interventions known to improve the safety of patient care	http://www.patientsafetyfirst.nhs.uk/content.aspx?path=/

Table 2. cont. Patient safety and communication improvement initiatives

Name	Organisation	Description	Source
NSW Safe Clinical Handover Program (Closed: Now under the In Safe Hands program)	NSW Health	To develop key principles for handover and provide a framework for implementation across a range of handover scenarios	http://www.archi.net.au/resources/safety/clinical/nsw-handover
In Safe Hands	Clinical Excellence Commission	A program of work to develop efficient and effective healthcare teams	http://www.cec.health.nsw.gov.au/programs/insafehands
Between the flags	Clinical Excellence Commission	A program of work to improve the recognition and response to clinical deterioration in acute healthcare	http://www.cec.health.nsw.gov.au/programs/between-the-flags
The Perinatal Patient Safety Project	Kaiser Permanente	To improve the safety of perinatal care by improving teamwork and promoting effective communication practices among nurses and physicians	(McFerran *et al.* 2005)
The I-PASS study	Paediatric Research in Inpatient Settings(PRIS) and Innovation in Paediatrics Education (IIPE)	To standardise the handoff process and develop materials which can improve handoffs of care in order to reduce medical errors	http://www.ipasshandoffstudy.com/

Table 3. Guidance and toolkits for handover and communication improvement

Name	Organisation	Description	Source
The Development of SOPs and Educational Resources for Shift-to-Shift, Medical and Nursing Handover.	Royal Hobart hospital and university of Tasmania	Handover risk assessment guide Handover Interview topic guide Handover SOP design checklist Handover observation guide	(Turner *et al.* 2009)
SafeTECH: SafeTools for Electronic Clinical Handover	Australian Department of Health, and eHealth Services Research Group (eHSRG), University of Tasmania	Guide for development of electronic tools to support handover and communication	(Thomas *et al.* 2009)
OSSIE guide to clinical handover improvement.	Australian Commission on Safety and Quality in Healthcare	Tools and techniques for evaluating handover Guide for solution development Handover risk assessment	(Australian Commission on Safety and Quality in Healthcare, 2010b)
Implementation Toolkit for Clinical Handover Improvement	Australian Commission on Safety and Quality in Healthcare	Tools and techniques for evaluating handover Guide for solution development Handover risk assessment	(Australian Commission on Safety and Quality in Healthcare, 2011)
Improving JMO clinical handover at all shift changes: Implementation Toolkit	Australian Resource Centre for Healthcare Innovations	Guidance for improving handover among NCHDs	(NSW Department of Health, 2010)
Implementation toolkit. Standard key principles for clinical handover.	NSW Health	Guidance for reviewing the handover process Handover redesign methodology List of key local pilot handover improvement projects	(NSW Department of Health, 2009)
The 'How to' Guide for Reducing Harm from Deterioration	Patient Safety First Initiative	Guidance on measuring for improvement Guidance on implementing SBAR or RSVP	(Patient Safety First, 2008)
The 'How to' Guide for Reducing Harm in Perioperative Care	Patient Safety First Initiative	Guidance on improving teamwork and collaboration through implementation of team briefings and safety checklist	(Patient Safety First, 2009)
Improving Safety in Maternity Services: Communication	The Kings Fund	Guidance on making improvements to inter-professional communication Maternity newsletter tool SBAR tool for ward handover SBAR sticker template	(Kings Fund, 2012)

ISBAR Toolkit	South Australia Department of Health	ISBAR resources ISBAR card, sticker, iphone app Example of how to customise ISBAR for use on an obstetric unit.	http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/clinical+resources/safety+and+quality/clinical+handover/isbar+-+identify+situation+background+assessment+and+recommendation
ISHAPED Patient-Centered Approach to Nurse Shift Change Bedside Report	Institute of Healthcare Improvement	ISHARED resources	http://www.ihi.org/resources/Pages/Tools/ISHAPED-PatientCenteredNurse-ShiftChangeBedsideReport.aspx
Safer Care. Improving patient safety. SBAR.	NHS Institute for Innovation and Improvement	SBAR resources SBAR template cards SBAR film scenarios	http://www.institute.nhs.uk/safer_care/safer_care/Situation_Background_Assessment_Recommendation.html
Victorian Quality Council improvement resources.	Victorian Quality Council	Clinical Handover (CH) organisational readiness checklist, CH template, suggested content for CH policy and suggested content for CH protocol or guidelines.	http://www.health.vic.gov.au/qualitycouncil/
Patient Handoff Toolkit	Association of Perioperative Nurses		http://www.aorn.org/PracticeResources/ToolKits/PatientHandOffToolKit/

Annex 5 (Literature Review Section)

Table 1. List of mnemonics identified

Mnemonic	Context	Content
The 'ABC' of handover	Shift handover (Farhan *et al*. 2010)	**A**reas and Allocation **B**eds, Bugs and Breaches **C**olleagues and Consultant on call **D**eaths and Disasters, including Deserters
ABC-SBAR	Communicating about deteriorating patients (McCrory *et al*. 2012)	**A**irway **B**reathing **C**irculation **S**ituation **B**ackground **A**ssessment **R**ecommendation
ACT SHARP	Escalating management of a deteriorating patient (Pillow, 2007)	**ACT** **S**ituation **H**istory/Background **A**ssessment **R**ecommendations **P**ut it in Writing
AIDET	Handoff from preoperative nurse to circulating nurse (Manias and Tomilson, 2006). Communication between patient and professional (American College of Obstetricians and Gynecologists, 2014)	**A**cknowledge (patient) **I**ntroduce (yourself) **D**uration (describe procedure) **E**xplain (the process) **T**hank you
ANTICipate	Shift handover (Vidyarthi *et al.* 2006)	**A**dministrative Data (patient demographics, room number, admission date, family contact information) **N**ew Information **T**asks **I**llness **C**ontingency Planning/Code Status

Table 1. cont. List of mnemonics identified

Mnemonic	Context	Content
BSAP	Shift handover (Pillow, 2007)	**B**ackground **S**ituation **A**ssessment **P**lan of care/Precautions/Problems/Pains, any questions?
CHAPS	Handover of care between obstetric registrars. Handover of care between midwives on delivery suite (Basu *et al*. 2011; Hatten-Masterson *et al.)*	**C**linical picture **H**istory **A**ssessment **P**lan **S**haring information
DESC	Communication of difficult conversations (Institute for Healthcare Improvement, 2008)	**D**escribe situation(s) **E**xpress concerns about what is happening **S**uggest alternative approaches **C**onsequences should be stated if change doesn't occur
dINAMO		**D**octor remember **I**dentify patient **N**eeds of patients and chief complaints **A**nalysis and state of the situation **M**edical management and planned treatment **O**rganisation and planned transfer, discharge
DRAW	Shift handover (Pillow, 2007)	**D**iagnosis **R**ecent changes **A**nticipated changes **W**hat to watch for in next interval of care
HANDOFF	Shift handover (Brownstein *et al*. 2007)	**H**ospital location **A**llergies/adverse reactions/medications **N**ame/age/number, DNAR/Diet/DVT prophylaxis **D**NAR (do not receive resuscitation) **O**ngoing medical/surgical problems **F**acts about the hospitalisation – to be included: important vital signs, significant lab results, access, procedures and results, list consultants involved, blood or blood product availability **F**ollow-up on?

Table 1. cont. List of mnemonics identified

Mnemonic	Context	Content
HAND ME AN ISOBAR	Shift handover (Yee *et al.* 2009)	**H**ey, it's handover time **A**llocate staff for continuity of patient care **N**ominate participants, time and venue **D**ocument on written sheets and patient notes **M**ake sure all participants have arrived **E**lect a leader **A**lerts, attention and safety **N**otice **I**dentification of patient **S**ituation and status **O**bservations of patient and call to MET **B**ackground and history **A**ction, agreed plan and accountability **R**esponsibility and risk management
I DO VITAL	Nursing shift to shift and ward transfer (Australian Resource Centre for Healthcare Innovations, 2009)	3 **I**'s (Introduce self/team / ID patient /Infection control precautions /review alerts) **D**iagnosis and History **V**ital Signs and Observations **I**nput = Output **T**reatment = Diagnosis **L**egal and Patient Learning
IMOUTA	Shift handover (Connor *et al.* 2013)	**I**dentifying information **M**edical course **OU**tcomes possible tonight **T**o do tonight **A**sk question and handoff
I-PASS	Paediatric ward shift handover (Debenham, 2013, Starmer *et al.* 2012)	**I**llness severity **P**atient summary: events leading up to admission, hospital course, on-going assessment and plan **A**ction list: to do list **S**ituation awareness and contingency planning: know what's going on, plan for what might happen **S**ynthesis by receiver: restates key action/to do items, summarises what was heard, asks questions

Table 1. cont. List of mnemonics identified

Mnemonic	Context	Content
I PASS the BATON	Emergency department handover (Sandlin, 2007, Thomas and Donohue-Porter, 2012)	**I**ntroduce yourself **P**atient (name and demographics) **A**ssessment **S**ituation **S**afety concerns **B**ackground **A**ctions **T**iming **O**wnership **N**ext
ISHAPED	Bedside nursing change of shift (Friesen *et al.* 2013)	**I** **S**tory: reviews the events or circumstance prompting the patients admission to hospital **H**istory: review patients medical history **A**ssessment: review the patients current condition and status **P**lan: review the plan of care, daily goal or shift goals **E**rror prevention: review the potential safety issues specific to the patient and communicate risk, and precautions **D**ialogue: throughout the report there should be discussion involving nurse and the patient
ISBAR	Shift handover (Thompson *et al.* 2011) Referral phone calls (Marshall *et al.* 2009)	**I**dentify **S**ituation **B**ackground **A**ssessment **R**ecommendation
ISoBAR	Inter-hospital transfer (Porteous *et al.* 2009) Shift handover and inter- and intra-facility handover (Department of Health (Western Australia), 2013)	**I**dentify **S**ituation **O**bservations **B**ackground **A**greed Plan **R**ead Back
NUTS		**N**ame – patient name and current diagnosis **U**nique – relate information specific to patient care **T**ubes – recount any IV, catheters **S**afety – concerns such as falls risk and medication reconciliation should be expressed

Table 1. cont. List of mnemonics identified

Mnemonic	**Context**	**Content**
PACE	Shift handover (Schroeder *et al.* 2006)	**P**atient/Problem **A**ssessment/Actions **C**ontinuing/Changes **E**valuation
PACT	Shift handover (Tapia *et al.* 2013)	**P**riority **A**dmission **C**hanges **T**ask review
PATIENT	Handover during the intra-operative period by Certified Registered Nurse Anaesthetists (Wright *et al.* 2013)	**P**atient (preoperative assessment and current condition) and positioning **A**irway (level of difficulty, current management), antibiotics, allergies, and type of anaesthetic **T**emperature (including type of monitoring and warming and/or cooling adjuncts) **I**ntravenous (including type of access, invasive lines, infusions, blood products) and intake and output **E**nd-tidal carbon dioxide (including ventilatory parameters such as respiratory rate, peak inspiratory pressure, oxygenation, and ventilation mode) **N**arcotics (including those administered as well as those that the oncoming anaesthetist is responsible for reconciling) **T**witches (including type of neuromuscular monitoring and degree of paralysis
PRIMARY	Handover to primary care (Lamb *et al.* 2011)	**P**erson **R**eason **I**nput **M**edical course **A**ssessment **R**esponsibilities **Y**our turn

Table 1. cont. List of mnemonics identified

Mnemonic	Context	Content
PEDIATRIC	Handovers in paediatric care (Arora and Johnson, 2006)	**P**roblem list **E**xpected tasks to be done **D**iagnostic one-liner **I**f/then **A**dministrative data **T**herapeutics **R**esults and other facts **I**v access/other invasive devices **C**ustody and consent issues
4 Ps	Shift handover (Hansten, 2003)	**P**urpose –why is patient here **P**icture – what results are we looking for short-term and long-term **P**lan – what did or didn't work **P**art – what part can you play during next shift
5 Ps v1	Multiple communication scenarios (Sandlin, 2007)	**P**atient (identify) **P**lan (plan of care) **P**urpose of plan **P**roblem (abnormal findings, vital signs) **P**recaution (isolation, falls)
5 Ps v2	Multiple communication scenarios (Ellis *et al.* 2007; Sandlin, 2007)	**P**atient **P**recautions **P**lan of care **P**roblems **P**urpose
7 Ps	Handover from Emergency Department (ED) to Internal Medicine (IM) (Adams *et al.* 2011)	**P**atient information **P**roblem **P**icture **P**rocess (what occurred in ED) **P**ending **P**lacement **P**lease Ask
PVITAL	Bedside shift to shift handover (Australian Resource Centre for Healthcare Innovations, 2009)	**P**– Present patient by name, age and presenting problem **V**isualise patient and orientate patient to oncoming shift **I**nput = Output **T**reatment = Diagnosis **L**egal and Patient Learning

Table 1. cont. List of mnemonics identified

Mnemonic	Context	Content
RESPECT	Patient professional communication (American College of Obstetricians and Gynecologists, 2014)	**R**apport **E**mpathy **S**upport **P**artnership **E**xplanations **C**ultural competence **T**rust
RSVP	Escalation of care for the deteriorating patient (Featherstone *et al.* 2008)	**R**eason – for the call **S**tory – narrative summary of the relevant background and history and reason for admission of patient **V**ital – vital signs summary **P**lan – which will be either a summary of the problem or a request to seek more experienced clinician)
SAFE	Obstetric anaesthesia shift handover (Dharmadasa *et al.* 2013)	**S**ick patients **A**t risk **F**ollow up **E**pidurals
ISBARR/SBARR	Nurse phone call to physician (Enlow *et al.* 2010)	**S**ituation **B**ackground **A**ssessment **R**ecommendation **R**ead back

Table 1. cont. List of mnemonics identified

Mnemonic	Context	Content
SBAR	Telephone referrals (Cunningham. *et al.* 2012; Joffe. *et al.* 2013) Multiple communication scenarios (Haig. *et al.* 2006; Velji. *et al.* 2008; Beckett and Kipnis, 2009; Gerard, 2012; Randmaa. *et al.* 2014) Shift handover (De Meester *et al.* 2012; Moseley *et al.* 2012; Cornell *et al.* 2013; Townsend-Gervis *et al.* 2014) Communicating about deteriorating adult patients (De Meester *et al.* 2012) Communicating about the deteriorating paediatric patients (McCrory *et al.* 2012) Handoff of post-operative surgical or procedural patients (Sandlin, 2007)	**S**ituation **B**ackground **A**ssessment **R**ecommendation
SEAM	Shift handover (Pillow, 2007)	**S**ummary (preceding history, reason for admission, hospital course, surgeries, medications, allergies) **EA** (Every Active problem)**M** (Management plan (important therapies, diagnostic studies yet to be performed)
SHARING	Handover between teams on an obstetrics and gynaecology department (Royal College of Obstetricians and Gynaecologists, 2010)	**S**taff **H**igh risk **A**waiting theatre **R**ecovery ward **I**nductions **N**ICU **G**ynaecology

Table 1. cont. List of mnemonics identified

Mnemonic	Context	Content
SHARED	Handover of surgical patients (Mathias, 2006) Handover between Visiting Medical Officers (VMO) and midwives (Hatten-Masterson and Griffiths, 2009)	**S**ituation **H**istory **A**ssessment **R**isk **E**xpectation **D**ocumentation
SHARQ	Multiple communication scenarios (Sandlin, 2007)	**S**ituation **H**istory **A**ssessment **R**ecommendations **Q**uestions
SIGNOUT	Shift handover (Horwitz *et al.* 2007; Horwitz *et al.* 2012; Bump *et al.* 2013; Starmer *et al.* 2013)	**S**ick or DNR) **I**dentifying data) **G**eneral hospital course) **N**ew events of the day) **O**verall health status/clinical condition) **U**pcoming possibilities with plan, rationale) **T**asks to complete overnight with plan, rationale) **?** (questions)
SOAP	Ward rounds (Abraham *et al.* 2013)	**S**ubjective **O**bjective **A**ssessment **P**lan
SOUND	Handoffs in the ED (Gopwani *et al.* 2013)	**S**ynthesis **O**bjective Data **U**pcoming Tasks **N**ursing Input **D**ouble Check

Table 1. cont. List of mnemonics identified

Mnemonic	Context	Content
SNAPPI	Communication among anaesthesia teams (Weller *et al.* 2014)	**S**top the team **N**otify of the patient's status **A**ssessment of the situation **P**lan what to do **P**riorities for actions **I**nvite ideas.
TRANSMIT	Paediatric weekend shift handover (Hawcutt *et al.* 2013)	**T**asks **R**espiratory **A**nticipated problems **N**utrition **S**epsis **M**edication **I**ntravenous access **T**ransfer/Discharge
UPDATED	Shift handover (DeKosky *et al.* 2012)	**U**pdated admin data? **P**roblem list **D**iagnosis list **A**nticipated problems? **T**oo much information? **E**rror prone medications clear and correct? **D**irections clear and concise?

Annex 6 (Literature Review Section)

Table 1. Level of evidence of the included studies		
1++	High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias (RCTs rated as high quality (++) using the SIGN checklist for RCTs)	-
1+	Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias (RCTs rated as acceptable (+) using the SIGN checklist for RCTs)	Marshall *et al.* (2009), Marshall *et al.* (2012), Cunningham *et al.* (2012), Weiss *et al.*(2013), Salzwedel *et al.* (2013)
1-	Meta-analyses, systematic reviews, or RCTs with a high risk of bias (RCTs rated as unacceptable (-) using the SIGN checklist for RCTs)	Joffe *et al.* (2013a), Bump *et al.* (2012), Lee *et al.* (1996), Van Eaton *et al.* (2005), Van Eaton *et al.* (2010)
2++	High quality systematic reviews of case control, cohort studies, RCTs or before-and-after intervention studies (Rated as high quality (++) using the SIGN checklist for reviews)	Abraham *et al.* (2014)
2++	High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal	Pothier *et al.* 2005; Bhabra *et al.* 2007
2+	Systematic reviews of case control, cohort studies, RCTs or before-and-after intervention studies with a possible risk of bias (Rated as acceptable (+) using the SIGN checklist for reviews)	Arora *et al*. (2009), Russ *et al.* (2013), Riesenberg *et al*. (2009b), Flemming *et al*. (2013), Robertson *et al.* (2014)
2+	Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal	-
2-	Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal. Before-and-after intervention studies with a risk that the relationship is not causal.	Remaining empirical studies which evaluated the effectiveness of tools or practices
3	Non-analytic studies, e.g. case reports, case series, post-implementation audit/review	Studies which evaluated the effectiveness of tools or practices: Vergales *et al.* (2014), Olm Shipman *et al.* (2011), Johnson *et al.* (2013), Adams *et al.* (2011), Vardaman *et al.*(2012), Chaboyer *et al.* (2008) Remaining empirical studies which assessed current practice in handover.
4	Expert opinion	-

Table 2. Grading of recommendations	
A	At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population or; A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results
B	A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+
C	A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2++
D	Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+

National Quality Assurance Criteria Score

Title	Score
British Medical Association (BMA) (2004). *Safe handover: safe patients. Guidance on clinical handover for clinicians and managers.*	3
Cincinnati Children's Hospital Medical Center (2013). *Best Evidence Statement. Increasing Patient Satisfaction by Moving Nursing Shift Report to the Bedside.*	5
Department of Health, Western Australia (2013). *WA Clinical Handover Policy*. Perth: Department of Health, WA.	3
Department of Health (South Australia). (2013). *Clinical Handover Guideline*. Department of Health (South Australia). (2013). *Clinical Handover Policy*.	3
Royal College of Surgeons of England. (RCSE) (2007). *Safe handover: Guidance from the Working Time Directive working party*.	N/A
NSW Department of Health (2009). *Implementation Toolkit. Standard Key Principles for Clinical Handover*.	N/A
Australian Commission on Safety and Quality in Health Care (ACSQHC) (2012). *National Safety and Quality Service Standards. Standard 6: Clinical Handover.*	N/A

Appendix 3: Guideline Development Group - Schedule of Meetings 2013-2014

Communication (handover) Sub-group / Guideline development group Schedule of Meetings 2013-2014	
Date	**Time**
Oct 10th 2013	14.30 – 15.30hrs
Nov 6th 2013	14.30 – 15.30hrs
January 14th 2014	14.30 – 15.30hrs
Feb 18th 2014	14.30 – 15.30hrs
Mar 11th 2014	11.00 – 12.00hrs
Apr 15th 2014	11.00 – 12.00hrs
May 13th 2014	11.00 – 12.00hrs
June 10th 2014	11.00 – 12.00hrs
July 1st 2014	11.00 – 12.00hrs
Aug 11th 2014 (additional)	12.00 – 16.00hrs
Aug 13th 2014 (additional)	10.30 – 16.00hrs
Aug 19th 2014	11.00 – 12.00hrs
Sept 16th 2014	11.00 – 12.00hrs
Oct 14th 2014	11.00 – 12.00hrs
Nov 11th 2014	14.00 – 15.00hrs

Appendix 4: SWOT analysis - barriers and enablers

National Communication Project – SWOT, Barriers and Enablers	
Strengths	• Standardisation and minimisation of variables reduces risk for patients • Standardised communication practice for all healthcare staff will ensure: o Easy transfer of patients from one care facility to another and to a higher level of care o Minimal training requirements for staff transferring from one healthcare setting to another resulting in ease of movement of staff throughout the system • Empowering for staff • Corporate knowledge
Weaknesses	• Existing practices – local preferences • Resistance to change • No national policy • Challenge to implementing policy and monitoring adherence • long-standing hierarchical structures
Opportunities	• Develop national policy • Implement across all healthcare settings • Address national agenda – HSE, DoH, HIQA • E-Learning programme for ISBAR and $ISBAR_3$ • Include education in undergraduate programmes • Build on existing programmes • Make communication a priority for patient safety
Threats	• Needs full support from high level HSE • Existing tools • Resistance to change from staff • Lack of Compliance • Lack of clarity re: responsibility for implementation, monitoring and sustainability • long-standing hierarchical structures
Barriers	• Resistance to change • Lack of leadership • Lack of governance arrangements • Lack of clearly identified roles and responsibilities • Long-standing hierarchical structures • Lack of resources • Lack of education • Lack of IT support for evaluation and audit • Lack of standardised I.T. systems in general
Enablers	• Committed staff at senior level and in the clinical areas • Good leadership • Effective governance arrangements to include clear accountability and authority • Clearly identifies roles and responsibilities • Multi-disciplinary team working • IT support • Dissemination of information • Build on existing education and training for staff

Appendix 5: AGREE II tool

AGREE II INSTRUMENT

DOMAIN 1. SCOPE AND PURPOSE

1. The overall objective(s) of the guideline is (are) specifically described.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The background (1.1); scope and target population (1.4) are clearly articulated in section.

2. The health question(s) covered by the guideline is (are) specifically described.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

This is articulated in the section 1.3.1 as the 'Expected Outcome', what the guideline covers (1.4.1) is clear.

3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The population for whom the guideline is meant to apply is specifically described in the Scope (1.4).

DOMAIN 2. STAKEHOLDER INVOLVEMENT

4. The guideline development group includes individuals from all relevant professional groups.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

There has been a wide-ranging and diverse group of professionals and patient representative who engaged with and contributed to the developmental process of the guideline as listed in section 1.5.

5. The views and preferences of the target population (patients, public, etc.) have been sought.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

There was an extensive systemic review undertaken which was enhanced by the fieldwork undertaken including focus groups, individual and group interviews and observational study. The undertaking of a general consultation provides the opportunity to source the views of the target population.

6. The target users of the guideline are clearly defined.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The target users are clearly defined in the Scope (1.4).

DOMAIN 3. RIGOR OF DEVELOPMENT

7. Systematic methods were used to search for evidence.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

There was an extensive systematic methodology employed to search for the evidence. Electronic databases are listed, with the time periods searched, the search terms and the outcomes of the search strategy are presented using the PRISMA framework.

8. The criteria for selecting the evidence are clearly described.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

Inclusion and exclusion criteria are identified and are easily located in the systematic review.

9. The strengths and limitations of the body of evidence are clearly described.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The strengths and limitations of the body of evidence are clearly described and address study design, outcomes and generalisability.

DOMAIN 3. RIGOR OF DEVELOPMENT – continued

10. The methods for formulating the recommendations are clearly described.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The method of developing the recommendations is clearly described in methodology and literature review (1.7). The Guideline Development Group discussed each recommendation in detail and included based on unanimous or consensus agreement. External feedback was sought and utilized to further revise the guideline.

11. The health benefits, side effects, and risks have been considered in formulating the recommendations.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The systematic review concludes that it is not possible that any one method of standardizing handover will improve patient outcomes. Other wider issues which impact on the effectiveness of handover will also require improvement initiatives.

12. There is an explicit link between the recommendations and the supporting evidence.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

DOMAIN 3. RIGOR OF DEVELOPMENT – continued

13. The guideline has been externally reviewed by experts prior to its publication.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

Externally by both national and international experts.

14. A procedure for updating the guideline is provided.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

A procedure for updating the guideline as outlined by the NCEC will be adhered to.

DOMAIN 4. CLARITY OF PRESENTATION

15. The recommendations are specific and unambiguous.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The overarching indirect aim of enhancing patient safety is not explicit in each recommendation as the recommendations have to be considered in their totality.

16. The different options for management of the condition or health issue are clearly presented.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

N/A The nature of this guideline does not lend itself to considering options as the key components embrace a practice and is broad in scope.

17. Key recommendations are easily identifiable.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The recommendations are clear, concise, easily identifiable and set out in three discrete groups/categories. An overarching summary of the recommendations precedes the details.

DOMAIN 5. APPLICABILITY

18. The guideline describes facilitators and barriers to its application.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The rational of each recommendation describes the facilitators and barriers from a general perspective. The barriers and enablers together with a SWOT are clearly identified in Appendix 4

19. The guideline provides advice and/or tools on how the recommendations can be put into practice.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

The guideline provides overarching practical guidance on tools and for the implementation. This is outlined in the evidence and supported by expert opinion. The guideline recommends a modified version of a communication tool currently utilized as a structured framework for Communication (handover) for patient deterioration, shift and inter-departmental handover.

20. The potential resource implications of applying the recommendations have been considered.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

Considered as an integral component of the discussions, but not explicit and will require exploration/ analysis from an implementation group/body. The final recommendation sets out the need for the establishment of an implementation group.

21. The guideline presents monitoring and/or auditing criteria.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

DOMAIN 6. EDITORIAL INDEPENDENCE

22. The views of the funding body have not influenced the content of the guideline.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

A description of the funding and source of this for the systematic review is described in the guideline

23. Competing interests of guideline development group members have been recorded and addressed.

1	2	3	4	5	6	7√
Strongly Agree						Strongly Disagree

Comments

Each member of the Guideline Development Group was required to complete and submit a declaration with regard to any conflict of interest.
A statement re: Conflict of Interest is included in the document stating that there are none.

OVERALL GUIDELINE ASSESSMENT

For each question, please choose the response which best characterizes the guideline assessed:

Rate the overall quality of this guideline.

1 Lowest possible quality	2	3	4	5	6	7√ Highest possible quality

Would recommend this guideline for use.

Yes	
Yes, with modifications	√ **with minor modifications**
No	

NOTES

Appendix 6: National survey and fieldwork report

National Survey and Fieldwork Report Re: Communication (Clinical Handover) in Maternity Services in Ireland

Data collection and analysis carried out by:

Gerard Fealy and Deirdre Munroe (midwifery researcher)

September 2014

STAKEHOLDER CONSULTATION

1 DESIGN

1.1 Introduction

In March 2013 the HSE established a *National Implementation Support Group* to coordinate and oversee the implementation of recommendations made by the team which investigated the events at Galway University Hospital in October 2012 relating to the tragic maternal death of Mrs Savita Halappanavar (Incident 50278). As part of its work, the Group established a Communication (Handover) Sub-group/Guidelines Development Sub-Group to address the communication and handover recommendations of the HSE, Coroner's and HIQA reports of the incident. The Sub-group, in turn, commissioned the UCD School of Nursing, Midwifery and Health Systems to conduct research into aspects of communication practices within maternity services in Ireland, with a particular focus on clinical handover. The aim of the research was to describe clinical handover practices in maternity hospitals and co-located maternity units in Ireland. The overarching aim was to inform the development of clinical guidelines for handover and, thereby, improve clinical handover practices in maternity services.

1.2 Design and data collection methods

The design for the research was informed by the methods used in previous studies identified in the systematic review of literature conducted on behalf of the Guidelines Development Sub-group (Fealy and Riordan 2014) and involved a methodological triangulation approach using multiple data collection methods in combination. With the aim of obtaining information from representative samples of key stakeholders, the methods included: a national postal survey of all maternity hospitals and co-located maternity units; focus group discussions and individual interviews with key informants and non-participant observation of clinical handover practices in the maternity services. The key informants included chief executive officers of maternity services, medical staff; midwifery staff; pharmacists; radiologists; pathologists; health and social care professionals; and service users (Figure 1).

The national postal survey was administered to all chief executive officers or their equivalent in each maternity hospital and co-located maternity unit in Ireland. The survey instrument was the Clinical Handover Practices Questionnaire (CHaPs-Q) (Fealy *et al*. 2014). The instrument is a short self-report questionnaire designed to elicit information on clinical handover policy and practices. It comprised five categories, as follows: 'current systems and processes of handover': 'inter-hospital handover'; 'inter-departmental handover'; 'intra-departmental handover'; inter-professional handover' and 'hospital demographic information'. The items were set out as either statements or lists, and designed as dichotomous items or simple tick boxes.

Non-participant observation of clinical handover events was conducted using a structured observation tool, which enable a structured description of the content and process of handover events, including shift handover and clinical rounds. It was set out in three sections, as follows: Section 1: 'setting, location, type, duration, personnel and tools'; Section 2: 'content of handover report'; and Section 3: 'process of handover'.

The aim of the focus groups discussions and individual interviews was to generate nuanced accounts of handover practices, including differentiated descriptions of types of handover by time, place, purpose and content. Focus group discussions and individual interviews were conducted among a purposive sample of key informants, including clinicians and service users. Each focus group was facilitated by a moderator and conducted according to a topic guide,

standardised with four discussion categories, as follows: 'current handover practices', 'tools and other supports'; 'barriers and enablers'; and 'the ideal handover'. In this way, discussions were directed towards the participants' experiences of handover and related practices. For the service user focus groups, the topic guide was focused on their experiences of communication and as participants in bedside handover. Individual interviews were conducted using a topic guide containing the same category headings used in the focus group discussions. The topic guides were based on the literature concerned with clinical handover practices and were aimed at enhancing the validity of the findings. The focus groups and interviews were conducted over a period of 12 weeks and the duration of each focus group and interview was between 30 and 60 minutes.

Sample and sampling

The national survey of the maternity hospitals and co-located maternity units was conducted by postal questionnaire using the CHaPs-Q questionnaire. The unit of analysis for the survey was the individual hospital or co-located unit and, hence, the questionnaire was administered to the chief executive officer or their equivalent at each hospital or unit. Sampling for the non-participant observation was by purposive sampling, with clinical handover events observed in a small number of units. All 19 stand-alone hospitals or co-located units were included when recruiting participants for interviews and focus group discussions. Sampling within each hospital or unit for the focus groups and interviews was on the basis of purposive sampling.

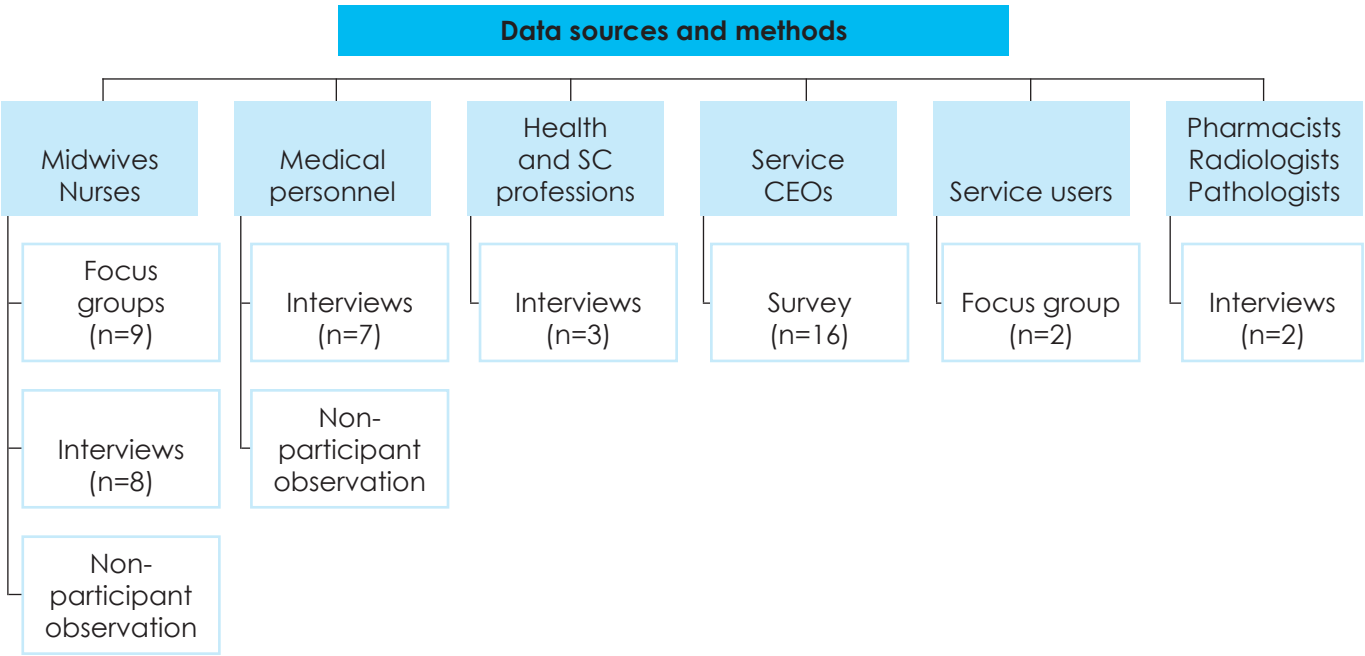


Figure 1 Methods of data collection and sources of data

Data collection procedures
The ChaPS-Q questionnaire was administered to the chief executive officer or their equivalent at each hospital and each hospital was asked to return just one completed questionnaire. In line with best-practice evidence for the conduct of postal surveys, the CHaPs-Q was be administered by post using three contacts with the sample, in order to maximise the response rates (Edwards *et al.* 2007; Dillman 2000). Non-participant observation was conducted in purposively selected maternity care settings, with the permission of the Director of Midwifery and the Medical Director. Individual interviews and focus group discussions took place at or near to the participants' place of work, in a private meeting room.

Recruitment procedures for focus groups and interviews
Recruitment to the interviews and focus group discussions was by a combination of direct written invitation for interviews and proxy recruitment for focus groups. Prospective participants in the interviews were recruited by written invitation and the letter of invitation included an information sheet and a consent form. Once each data collection site was selected for focus groups, the relevant service director (i.e. Director of Midwifery or Medical Director) was written to, informed of the study's purpose, and invited to nominate up to twelve individuals to participate in a focus group. In the case of the focus groups involving service users, recruitment was through a service user's representative group. Each letter of invitation was followed up by telephone and/or e-mail contact, in order to negotiate a suitable time and venue for the each planned data collection event. Every effort was made to ensure that the timing and location of focus groups and interviews caused minimal disruption to individual participants and to the services in which the data collection occurred.

1.3 Data handling

Data obtained using the CHaPs-Q was analysed using SPSS Version 20.0 (SPSS Inc. Chicago IL). Calculations of frequency distributions, measures of central tendency and measures of variability were conducted to summarise data. Data obtained in the non-participant observation checklist was analysed using frequency distributions and measures of central tendency and variability. Data obtained from the focus groups and interviews was analysed using thematic content analysis. The overall outcome of the qualitative analytical process was the development of emergent themes, described in a narrative account supported with exemplary data extracts.

1.4 Ethical approval

An application for ethical approval was made to the UCD Human Research Ethics Committee (HREC). The detailed procedures for the conduct of the data collection, including the survey, non-participant observation, focus groups and the individual interviews were included in the submitted application. All focus group participants, interviewees and participants involved in the non-participant observation were asked to give written informed consent prior to their participation. No names of individuals or their organisation were recorded during the data collection or identified in the report, and all data were stored securely in a password-protected computer at the UCD Nursing and Midwifery Research Unit. The return of completed questionnaires was taken to indicate consent to participate national postal survey.

2. FINDINGS PART 1: NATIONAL SURVEY

2.1 Introduction

A national survey of the nineteen maternity units, including the stand-alone maternity hospitals and co-located maternity units (hereafter hospitals/units), in Ireland involved a short self-report questionnaire to elicit information on methods and systems of communication in maternity services, with particular reference to handover policy and practices. The unit of analysis was the individual hospital or unit and the questionnaire was administered to the chief executive officer of each hospital or unit. Designed specifically for the study and designated the Communication and Handover Practices in Hospitals Questionnaire (CHaPS-Q), the questionnaire comprised five categories, as follows: 'current systems and processes of communication': 'inter-hospital communication; 'inter-departmental communication'; 'intra-departmental communication'; inter-professional communication' and 'hospital demographic information'. The national survey was administered in July 2014.

2.2 Findings

Of the nineteen maternity units including the stand stand-alone maternity hospitals and co-located maternity units surveyed, sixteen completed questionnaires were returned, representing a response rate of 84 per cent. The sample consisted of 3 (18.8%) stand-alone maternity hospitals and 13 (81.3%) co-located maternity units. The majority of the hospitals (75%, n=12) and units surveyed contained fewer than 100 beds, with just one quarter (75%, n=4) containing 100-200 beds (Figure 1).

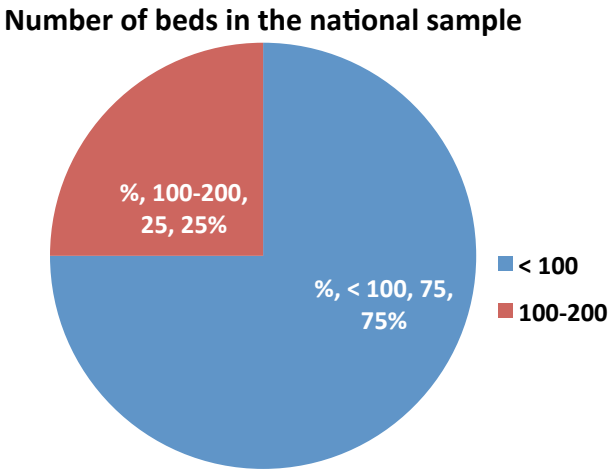


Figure 1. Size of hospital or unit by number of beds

Activity

The level of clinical activity in each hospital was measured using the number of annual admissions recorded and also the number of babies born in the most recent returns to the Department of Health. While upwards of half of the hospitals/units (46%, n= 7) were in the category of between 1000 and 3000 admissions (Figure 2), one fifth (20%, n=3) had up to 5,000 admissions and one fifth had more than 9000 admissions. This latter figure most closely equates to the number of admissions of the stand-alone maternity hospitals.

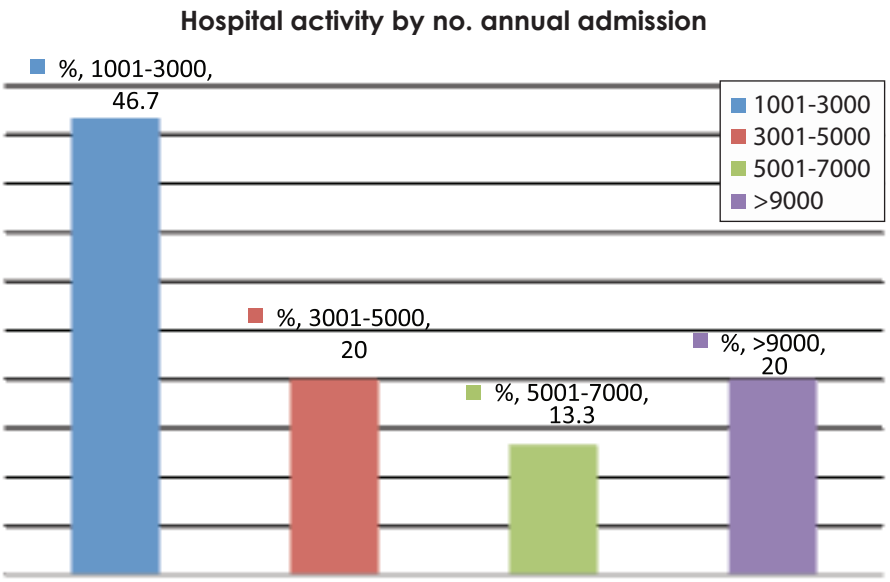


Figure 2 Number of annual admissions recorded in most recent returns to DoH

The findings show that the level of activity by the number of births was low overall for the sample, relative to the activity for the county's main stand-alone maternity hospitals, with 69 per cent (n=11) of the hospitals or units reporting between 1001 and 3000 births per annum and just one hospital/unit reporting >9,000 annual births (Figure 3).

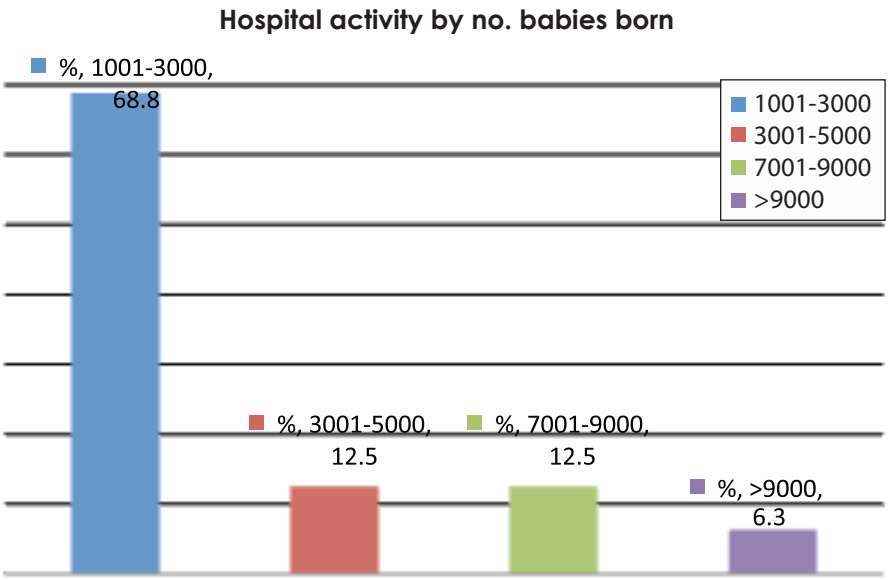


Figure 3 Number of babies born recorded in most recent returns to DoH

The level of activity in the hospitals/units was also measured with reference to the number of surgical operations or procedures (including Caesarean section, gynaecological, fertility) recorded in most recent annual returns to the Department of Health. The findings indicate that the vast majority (81%) of hospitals/units recorded ≤3000 surgical procedures, of which number 19 per cent (n=3) recorded between <1000 procedures (Figure 4).

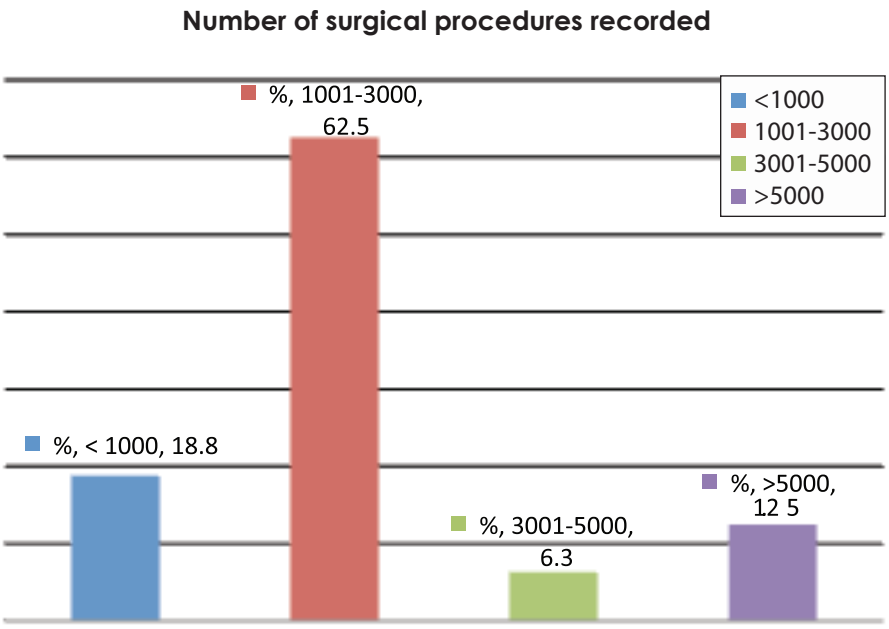


Figure 4 Number of surgical procedures recorded in most recent returns to DoH

Staffing

The questionnaire also sought information from each hospital on the staffing levels dedicated to each hospital/unit. Table 1 summarises the number of medical staff whole-time equivalents (WTEs) reported by the sample.

Table 1: Medical staff whole-time equivalents (WTE)

Consultant obstetricians		
WTE	n	%
2.0	1	6.25
3.0	4	28.6
4.0	5	35.7
6.5	1	6.25
8.0	1	6.25
10.2	1	6.25
12.2	1	6.25

NCHD (obstetric rotation)		
WTE	n	%
1.0	1	6.25
2.0	3	18.75
3.0	2	12.5
5.0	2	12.5
8.0	1	6.25
9.0	1	6.25
15.5	1	6.25
19.0	1	6.25
20.0	1	6.25

Non-consultant hospital doctor		
WTE	n	%
5.0	2	12.5
6.0	1	6.25
6.5	1	6.25
8.0	1	6.25
9.0	2	12.5
10.0	2	12.5
11.0	1	6.25
12.0	1	6.25
25.2	1	6.25
40.5	1	6.25

Anaesthetist		
WTE	n	%
.0	4	25.0
1.0	2	18.2
2.0	1	6.25
10.0	1	6.25
11.5	1	6.25
12.3	1	6.25
15.0	1	6.25

The number of obstetric consultant WTEs ranged from 2 to 12.2, with four hospitals/units reporting 2 consultants and five reporting 4. Two hospitals/units reported having 12.2 WTE obstetric consultants. Non-consultant hospital doctors (NCHDs) ranged in number from 5 to 40.5, with the majority of hospitals/units (56.25%, n=9) reporting 10 or fewer NCHD whole-time equivalents. Just one hospital/unit reported 40.5 WTEs in this category. The number of NCHDs on obstetric rotation ranged from 1 to 20, with eight of hospitals/units (50%, n=8) reporting 5 or fewer NCHD whole-time equivalents. Just three hospitals/units reported more than 15 NCHDs. The number of anaesthetists (consultant and non-consultant) dedicated to the maternity service ranged from 0 to 15 WTEs. Of the sample that responded, four (25%) reported having no consultant or non-consultant anaesthetist dedicated to the maternity service, two reported having 1 anaesthetist WTE and the remainder reported numbers ranging from 2.0 WTEs to 15.0 WTEs in this grade category (Table).

Table 2 summarises the number of other consultant grades. The number of consultant radiologist WTEs ranged from 0 to 4 WTEs, and of the hospitals/units that provided information on this item, five reported having no dedicated consultant radiologist. The number of consultant microbiologist ranged from 0 to 0.6 WTEs. Of the hospitals/units that provided information on this item, six reported having no dedicated consultant microbiologist. The number of consultant pathologist ranged from 0 to 2.0 WTEs. Of the hospitals/units that provided information on this item, five reported having no dedicated consultant pathologist.

Table 2: Other consultant whole-time equivalent (WTE)

Consultant radiologist		
WTE	n	%
.0	5	31.25
.5	1	6.25
.8	1	6.25
4.0	2	12.5

Consultant microbiologist		
WTE	n	%
.0	6	37.5
.1	1	6.25
.4	1	6.25
.5	1	6.25
.6	1	6.25

Consultant pathologist		
WTE	n	%
.0	5	31.25
.1	1	6.25
1.0	1	6.25
1.9	1	6.25
2.0	2	12.5

Table 3 summarises the number of midwife WTEs reported by the sample. The number of staff-midwife WTEs ranged greatly from 22.9 to 275.0 WTEs. The majority of the sample (62.5%, n=10) had fewer than 100 staff-midwife WTEs dedicated to the maternity services and the remainder had between 113 and 275 staff midwife WTEs. The questionnaire also sought details of the number of neo-natal ICU nurse WTEs.

The responses returned showed that the range of neonatal ICU nurses was 6.0 to 68.02. The majority of the sample (62.5%, n=10) had fewer than 20 neonatal ICU nurse, and two hospitals/units had 68 WTEs in this category. The number of student midwife WTEs within the hospitals/units ranged greatly from 0 to 87, with half (50%, n=8) reporting fewer than 30 student midwife WTEs and there was one outlier in the distribution, reporting a total of 87 WTEs for this staff category. Four of the hospitals/units had no midwifery students. The majority of the sample (62.5%, n=10)

had fewer than 100 staff midwife WTEs dedicated to the maternity services and the remainder had between 113 and 275 staff midwife WTEs.

Table 3: Midwife whole-tine equivalents (WTE)

Staff midwife		
WTE	**n**	**%**
≤50	6	40.2
51–100	4	26.8
100–150	2	13.4
151–200	1	6.25
201–250	1	6.25
251–300	1	6.25

Neonatal ICU nurses		
WTE	**n**	**%**
≤10	6	31.5
11–20	4	25
21–30	1	6.25
31–40	2	12.5
41–50	1	6.25
≥51	2	12.5

Midwifery student		
WTE	**n**	**%**
.0	4	28.6
2.0	1	6.25
2.5	1	6.25
3.0	1	6.25
4.0	1	6.25
10.0	1	6.25
20.0	1	6.25
27.9	1	6.25
29.5	1	6.25
31.5	1	6.25
87.0	1	6.25

Table 4 summarises the number of other health professional grades employed. Three hospitals/units reported having no radiographer, including ultrasonic radiographer, dedicated to its maternity services, while the remainder of the sample that responded to this item reported having whole-time equivalents ranging from 0.5 to 9.0.

Table 4: health professions whole-time equivalent (WTE)

Radiographer		
WTE	**n**	**%**
.0	3	18.75
.5	1	10.0
2.0	1	10.0
3.7	1	10.0
4.0	1	10.0
5.0	2	20.0
9.0	1	10.0
Total	10	100.0

Physiotherapist		
WTE	**n**	**%**
.0	3	23.1
.2	2	12.5
.5	2	12.5
1.0	1	6.25
1.5	1	6.25
3.0	1	6.25
3.1	1	6.25
4.3	1	6.25
8.0	1	6.25

Dietician/nutritionist		
WTE	**n**	**%**
.0	5	45.5
.2	1	6.25
1.0	3	27.3
1.7	1	6.25
4.0	1	6.25

Social worker		
WTE	**n**	**%**
.0	7	53.8
1.0	1	6.25
1.5	1	6.25
2.0	1	6.25
4.0	1	6.25
4.5	1	6.25
5.1	1	6.25

The number of physiotherapist WTEs dedicated to the maternity services was reported as ranging from 0 to 8.0, with eight of the hospitals/units reporting ≤1 physiotherapist WTEs. Five of the hospitals reported having no dietician/nutritionist dedicated to the maternity services, while three had one. The reported number of social worker WTEs dedicated to the maternity services ranged from 0 to 5.1, with seven of the hospitals/units reporting having no dedicated social worker.

2.3 Systems and processes of communication

Section A of the questionnaire sought information of current systems and processes of handover communication. This included questions on: organisational policy (8 items), staff training and continuing professional development (9 items), Information technology (IT) infrastructure (10 items), handover practices (6 items) and handover tools in use (4 items)

Organisational policy

Table 5 summarises the responses to the items seeking information on organisational policy concerning communication. While most of the hospitals/units reported their practices in this category, a small proportion failed to complete all items in the category. The vast majority of the hospitals/units (93.3%, n=15) reported that they considered 'handover' to be a high-risk activity and, while the majority (80%, n= 12) also reported having a written local policy to guide professional communication in general, just over a quarter (26.7%, n=4) reported that they had a written local policy specifically to guide the practice of handover. Most hospitals/units (93.8%, n=15) also had a local committee with responsibility for issuing clinical guidelines and the most (93.8%) also indicated that this was multidisciplinary in composition. Fourteen of the sixteen hospitals/units (93.8%) reported that their local committee develops clinical guidelines from up-to-date published evidence and routinely issues guidelines published by third parties, such as the HSE and HIQA.

Table 5 Organisational policy

		Yes	No
1	Clinical handover (hereafter 'handover') is considered a high-risk activity	15 (93.5%)	1 (6.25%)
2	There is a written local policy to guide professional communication in general	12 (75%)	3 (18.75%)
3	There is a written local policy specifically to guide the practice of handover (e.g. handover at change of duty shift)	4 (26.7%)	11 (68.75%)
4	The local policy addresses practice in relation to handover for escalation of care, once patient deterioration is identified by clinical staff	8 (50%)	1 (6.25%)
5	There is a local committee with responsibility for issuing clinical guidelines	15 (93.5%)	1 (6.25%)
6	The committee is multidisciplinary in its composition	14 (93.8%)	1 (6.25%)
7	The committee develops clinical guidelines from up-to-date published evidence (e.g. from systematic reviews of literature)	13 (81.25%)	0
8	The committee routinely issues guidelines by third parties (e.g. HSE, HIQA, professional bodies like royal colleges)	14 (87.5%)	0
(n=16)			

Staff training and continuing professional development

Organisations provided information on their arrangements for staff training and continuing professional development in relation to communication and handover practices. However, many respondents failed to complete all items in this category. Just over one third (37.5%, n=6) of hospitals/units reported that their clinical staff routinely undergo training in communication practices specific to handover and just one hospital/unit reported that staff training pertaining to handover was compulsory for all grades of clinical staff. Hospitals/units provided limited information in returned questionnaires on the staff grade types who routinely attend training in communication practices specific to handover; the responses are summarised in Table 6.

Table 6 Staff training and continuing professional development

	Section A: Staff training and continuing professional development	**Yes**	**No**
9	Clinical staff routinely undergo training in communication practices specific to handover	6 (37.5%)	10 (62.5%)
10	Staff training pertaining to handover is compulsory for all grades of clinical staff	1 (6.25%)	12 (92.25%)
11	Consultant medical staff (e.g. obstetric consultant) routinely attend training pertaining to handover	1 (6.25%)	6 (37.5%)
12	Non-consultant medical staff (i.e. Specialist Registrar, Registrar and SHO) routinely attend training pertaining to handover	1 (6.25%)	6 (37.5%)
13	Midwifery managers routinely attend training pertaining to handover	2 (12.5%)	6 (37.5.0%)
14	Staff midwives routinely attend training pertaining to handover	2 (12.5%)	6 (37.5%)
15	Laboratory staff (e.g. microbiologist, pathologist) routinely attend training pertaining to handover	2 (33.3%)	4 (25%)
16	Radiology staff (e.g. radiologist, radiographer) routinely attend training pertaining to handover	1 (6.25%)	5 (31.25%)
17	Other health professionals (e.g. physiotherapist, dieticians, social workers) routinely attend training pertaining to handover	0	7 (43.75%)
(n=16)			

Information technology (IT) infrastructure
The hospitals/units also responded to items pertaining information on their information technology infrastructure. Half of the hospitals/units (50%, n=8) indicated that there was an electronic patient record (EPR) system, which functioned to maintain information on each patient admitted and over one third (37.5%, n=6) reported that the system was interoperable across departments (Table 7).

In the national survey, 'electronic patient record' was defined as '[an electronic] system which functions to maintain information on each patient admitted'.

Table 7 Information technology (IT) infrastructure

		Yes	No
18	There is an electronic patient record (EPR) system which functions to maintain information on each patient admitted	8 (50%)	7 (43.75%)
19	The EPR system is interoperable, i.e. information can be shared between departments (e.g. laboratory, ICU, fetal assessment, physiotherapy)	6 (37.5%)	3 (18.75%)
20	Clinical staff (e.g. NCHD's, midwives) routinely use the EPR to look up information about patients (e.g. medical history)	5 (31.25%)	0
21	Clinical staff routinely use the EPR to support communication during handover (e.g. at duty shift handover)	2 (40.0%)	3 (60.0%)
22	In addition to the EPR, there is an IT 'look up' system (e.g. peerVue), with which clinical staff access information, such as lab and/or imaging results	15 (100.0%)	0
23	See Table 8		
24	The 'look up' system is interoperable, i.e. information can be shared between departments	15 (93.5%)	1 (6.25%)
25	Using the 'look up' system, clinical staff routinely retrieve lab results	16 (100%)	0
26	Using the 'look up' system, clinical staff routinely retrieve imaging results	15 (93.5%)	1 (6.25%)
27	Clinical staff routinely use the 'look up' system to support communication during duty shift handover	7 (43.75%)	9 (56.25%)
(n=16)			

However fewer than one third (31.5%) of the hospitals/units reported that clinical staff used the EPR to look up information about patients and just two hospitals/units (12.4%) reported that clinical staff routinely used the EPR to support communication during handover.

The vast majority (93.5%, n=15) of the hospitals/units reported that, in addition to the EPR system, there was an IT 'look up' system, with which clinical staff could access patient information. Hospitals/units were asked to indicate the name of the 'look up' system and responses in the open text item resulted in the identification of 40 named systems (Table 8). The National Integrated Medical Imaging System (NIMIS) was listed most frequently (62.5%, n=10), followed by *Integrated Patient Management (Information) System (IPMS/IPMIS) (31.25%, n=5)*.

Table 8: Name of the IT 'look up' system listed by hospital/unit (item 23)
I LAB for laboratory results/ NIMMS in NNU
ICM
IPMS, LIS, RIS, MIRS
IPMS, NIMIS, Lab IT system
IPMS; NAS; PAS; PAC; Winpath
LIS (lab), NIMIS (x-ray)
Maternal + neonatal system = McKesson. Laboratory system - ISOFT. CTG=K2
Maternity information system (MIS), NIMIS
MIR, IPMS, NIMIS, Lab system (LIS)
NETACURE, IPIMS (sic), Maternity Information System, Lab look up
NIMIS, LAB Enquiry, IPMS
NIMIS, OPIMSUS, VIEWPOINT (Gyne/EPAY only), HQUAIFI, EBTS, TOMCAT
OBTV, MEDISCAN, PAS-LAB, NIM[I]S
PAS
VIEWPOINT, NIMUS (sic), METERM
WINPATH word enquiry 5.0, NIMIS: Radiology
(n=16)

Handover practices

Hospitals/units reported on their handover practices with reference to process, personnel involved, location and the use of handover tools. All of the hospitals/units (100%, n=16) reported that duty shift handover was routinely conducted in all clinical departments and the majority (62.5%, n=10) reported that shift handover was mainly conducted on a team basis, with a similar number (56.25%, n=9) reporting that shift handover was *not* mainly conducted on a one-to-one basis. Fewer than half of the sample (43.75, n=7) reported that shift handover was mainly conducted with both midwives and doctors present. The majority (81.25%, n=13) of hospitals/units reported that shift handover was mainly conducted away from the bedside and the same proportion (81.25%, n=13) responded that attendance at duty shift handover was mandatory for all oncoming staff (Table 9).

Just half of the sample (50%, n=8) reported that there was a single approved handover tool in use to support clinical handover and, of this number, five (31.25%) of the respondents listed the handover tool, as follows: 'Excel file or inpatients'; 'Handover book, list of patients'; 'Verbal report (local tool)'; 'Improving patient handover RCOG'; 'ISBAR'; 'The [hospital name] safety pause'.

Half of the respondents (50%, n=8) reported that the handover tool was *not* routinely used by all health professionals involved in clinical handover and no hospital/unit responded that the handover tool was routinely used by all health professionals involved in clinical handover. Fewer than half (43.75%, n=7) reported that use of the handover tool in use was mandatory.

Table 9: Handover practices			
		Yes	**No**
28	Duty shift handover is routinely conducted in all clinical departments (e.g. antenatal clinics, antenatal ward, ITU, delivery suits etc.)	16 (100%)	0
29	Duty shift handover is mainly conducted on a one-to-one basis, i.e. one clinician handing over to another clinician	5 (35.7%)	9 (56.25%)
30	Duty shift handover is mainly conducted on a team basis, i.e. one of more clinicians handing over to the team of clinicians coming on duty	10 (62.5%)	3 (18.75%)
31	Duty shift handover is mainly conducted with both midwives and doctors (i.e. NCHDs) present	7 (43.75%)	7 (43.75%)
32	Duty shift handover is mainly conducted away from the bedside (e.g. ward office, ward station)	13 (81.25%)	1 (6.25%)
33	Attendance at duty shift handover is mandatory for all oncoming staff	13 (81.25%)	0
34	There is a single approved handover tool in use to support clinical handover	8 (50%)	7 (43.75%)
35	Reported in the text		
36	The tool is routinely used by all health professionals involved in clinical handover (e.g. obstetricians, midwives, ED staff)	0	8 (50%)
37	The use of the handover tool is mandatory	7 (43.75%)	1 (6.25%)

2.4 Practices and systems to support effective handover

The CHaPS-Q questionnaire also sought information from respondents on handover practices in relation to location, staff grades, modes of handover and tool(s) in use to support handover. These aspects of handover practices were examined in respect of four distinct handover scenarios, as follows: inter-hospital, inter-departmental, intra-departmental (duty shift handover) and inter-professional (escalation of care).

Location of handover

Regarding inter-hospital communication, the majority of respondents listed the location of handover as the ward office (81.25%, n=13) and at the ward station (75%, n=12) and upwards on a half (43.75%, n=7) reported that it took place at the bedside. One respondent listed the telephone in this category (Table 10).

For inter-departmental handover, the majority of respondents reported that the location was at the bedside (87.5%, n=14), followed by the ward station (81.25%, n=13) and the ward office (68.75%, n=11). Over one third (37.5%, n=6) also indicated 'walk around ward' as the location for inter-departmental handover.

The majority of respondents indicated that the ward office (75%, n=12) and ward station (75%, n=12) were the locations used for duty shift handover, although upwards on half of the respondents (43.75%, n=7) also reported that duty shift handover was conducted at the bedside and the same proportion reported that the location was at 'walk around ward' (43.75%, n=7).

The vast majority of hospitals/units (93.5%, n=13) indicated that the bedside was the location for handover during escalation of care; however majorities also listed the ward office (75%, n=12) and the ward station (75%, n=12) as locations for handover in this scenario.

Table 10: Location of handover

Inter-hospital		
Location	**n**	**%**
At the bedside	7	43.75%
Ward office	13	86.7%
Doctor's office	5	31.25%
Ward Station	12	80.0%
Ward walk around	7	43.75%
Phone	1	6.25%

Inter-departmental		
Location	**n**	**%**
At the bedside	14	87.5%
Ward office	11	68.75%
Doctor's office	3	18.75%
Ward Station	13	81.25%
Ward walk around	6	37.5%
Phone	1	6.25%

Intra-departmental (shift handover)		
Location	**n**	**%**
At the bedside	7	43.75%
Ward office	12	75.0%
Doctor's office	2	12.5%
Ward Station	12	75.0%
Ward walk around	7	43.75%
Other	1	6.25%

Inter-professional (escalation of care)		
Location	**n**	**%**
At the bedside	15	93.75%
Ward office	11	68.75%
Doctor's office	5	31.25%
Ward Station	12	75.0%
Ward walk around	7	43.75%
From home	1	6.25%

Staff attending handover

Hospitals/units were also requested to report on the staff grades who attended handover in the four handover scenarios. Table 11 summarises the responses in respect of all four scenarios for this component of the questionnaire. For inter-hospital handover, the vast majority reported that the registrar (87.25%, n=14), senior house office (56.25%, n=9) midwife (75%, n=12) and clinical midwife manager (75%, n=12) attended. Upwards on a half of respondents (43.75%, n=7) reported that the consultant attended.

For inter-departmental handover, all respondents (100%, n=16) indicated that the midwife attended and majorities also indicated that the clinical midwife manager (75%, n=12) and the registrar (62.5%, n=10) attended. Half of the respondents reported that the senior house office (50%, n=8) attended and upwards on half (43.75%, n=7) reported that the consultant attended.

The majority of respondents reported that duty shift handover was attended by the midwife (87.25%, n=14), the clinical midwife manager (87.25%, n=14), the registrar (62.5%, n=10) and over half reported that the senior house office (56.25%, n=9) attended. Upwards on one third of respondents (31.75%, n=7) reported that the consultant attended.

Responses in respect of staff attending handover for escalation of care showed that for 14 of the 16 hospitals/units (87.25%), the midwife, the clinical midwife manager and the registrar attended handover. The majority also reported that the senior house officer (81.25%, n=9) and the consultant (56.25%, n=9) attended. Few of the respondents reported that the student midwife attended any of the fours handover scenarios.

Table 11: Staff attending handover

Inter-hospital		
Staff grade	**n**	**%**
NCHD: Registrar	14	87.25%
NCHD: SHO	9	56.25%
CMM	12	75%
Staff midwife	12	75%
Consultant	7	43.75%
HCA	1	6.25%

Inter-departmental		
Staff grade	**n**	**%**
NCHD: Registrar	10	62.5%
NCHD: SHO	8	50.0%
CMM	15	93.5%
Staff midwife	16	100%
Consultant	7	43.75%
Student midwife	1	6.25%

Intra-departmental (shift handover)		
Staff grade	**n**	**%**
NCHD: Registrar	10	62.5%
NCHD: SHO	9	64.75%
CMM	14	87.5%
Staff midwife	14	87.5%
Consultant	5	31.25%
Student midwife	2	12.5%
HCA	1	6.25%

Inter-professional (escalation of care)		
Staff grade	**n**	**%**
NCHD: Registrar	14	87.5%
NCHD: SHO	13	92.9%
CMM	14	87.5%
Staff midwife	14	87.5%
Consultant	9	56.25%
Student midwife	1	6.25%
Clinical director/ director of midwifery	1	6.25%

Communication handover tools in use

The hospitals/units were also requested to report on the handover tools in use to support handover in the four handover scenarios. The respondents were provided with a list of the most common tools and were asked to indicate the particular tools in use in their hospital/unit. Table 12 summarises the responses in respect of all four scenarios for this component of the questionnaire.

For inter-hospital handover, the majority (62.5%, n=10) reported that the ISBAR tool was used, and half the respondents (50%, n=8) reported that the National Maternity Chart was used for this handover situation. Other handover tools reported by small proportions of the respondents in this category included SBAR (18.75%, n=3), 'checklist' (31.25%, n=5) and a transfer letter (18.75%, n=3).

The ISBAR (56.25%, n=9) and National Maternity Chart (62.5%, n=10) were also the most commonly-cited handover tools in use for inter-departmental handover. Other tools reported in this category included checklist (31.25%, n=5), IMEWS (18.75%, n=3) and EPR-generated form (18.75%, n=3).

The most commonly-reported handover tools in use for shift handover was the National Maternity Chart, which was indicated by over half of the sample (56.25%, n=9). A small proportion of the respondents also cited ISBAR (25%, n=5), IMEWS (25%, n=4) and checklist (25%, n=4) and a quarter (25%, n=4) also indicated the use of a local chart or handover book.

Similarly, the most commonly reported handover tools in use for escalation of care situations included ISBAR (75%, n=12) and the National Maternity Chart (50%, n=8). Other tools reported in this category included, checklist (31.25%, n=5), IMEWS (25%, n=4) and EPR-generated form (18.75%, n=3).

Table 12: Handover tools in use

Inter-hospital		
Tool	**n**	**%**
None	0	0
National Maternity Chart	8	50%
SBAR	3	18.75%
ISBAR	10	66.7%
Checklist	5	31.25%
EPR-generated form	2	12.5%
IMEWS	3	18.75%
NEWS	1	6.25%
PNEWS	1	6.25%
Local maternity chart	1	6.25%
Transfer letter	3	18.75%
Medical handover sheet	1	6.25%

Inter-departmental		
Tool	**n**	**%**
None	0	0
National Maternity Chart	9	56.25%
SBAR	2	12.5%
ISBAR	10	62.5%
Checklist	5	31.25%
EPR-generated form	3	18.75%
IMEWS	3	18.75%
NEWS	1	6.25%
PNEWS	1	6.25%
Ambulance documentation, ED doc	1	6.25%
Computer generated docs	1	6.25%
Patient medical records	1	6.25%

Intra-departmental (shift handover)		
Tool	**n**	**%**
None	1	6.25%
National Maternity Chart	9	56.25%
SBAR	1	6.25%
ISBAR	7	43.8%
Checklist	4	25.0%
EPR-generated form	2	12.5%
IMEWS	3	18.75%
NEWS	1	6.25%
PNEWS	1	6.25%
Patient medical chart/ local maternity chart	2	12.5%
Kardex	2	12.5%
Local handover book/ ward day book	2	12.5%
Medical handover sheet	1	6.25%
Excel sheets	1	6.25%

Inter-professional (escalation of care)		
Tool	**n**	**%**
None	0	0
National Maternity Chart	8	50.0%
SBAR	2	12.5%
ISBAR	12	75.0%
Checklist	4	25.0%
Form generated from EPR	1	6.25%
IMEWS	4	25.2%
NEWS	1	6.25%
PNEWS	1	6.25%
Patient medical chart/ local maternity chart	1	6.25%

2.5 Modes of communication

Respondents were asked to indicate the principal modes of clinical handover used by clinicians in the four handover scenarios and were presented with a list of all the possible methods, either methods used singly or in combination. Respondents indicated several clinician-to-clinician modes of communication for each of the four handover situation categories.

The most commonly-used modes of communication for clinical handover in all four scenarios were verbal face-to-face only and verbal face-to-face supported by printed documents, such as EPR printout or lab printout (Table 13). Specifically, the majority of respondents reported that verbal face-to-face only (68.75% (n=11) and verbal face-to-face supported by printed documents (62.5%, n=10) were used for inter-hospital handover. Most respondents also reported using verbal face-to-face only (68.75%, n=11) and verbal face-to-face supported by printed documents (81.25%, n=13) for inter-departmental handover. All of the respondents reported using verbal face-to-face only (100%, n=16) and three-quarters reported using verbal face-to-face supported by printed documents (75% (n=12) for handover shift, while the majority used face-to-face only (68.75% (n=11) and verbal face-to-face supported by printed documents (81.25%, n=13) in situations of escalation of care. As Table 13 also indicates, sizeable proportions of the sample reported using several other modes of communication, including verbal face-to-face supported by IT-based look up of lab reports; for example, just over half of respondents (53.25%, n=9) reported using this method for duty shift handover. Upwards on half of respondents (43.75%, n=7) indicated the use of telephone only and telephone supported by printed document(s) for inter-departmental handover. Similarly, for escalation of care, half of the respondents (50%, n=8) reported using telephone only and a majority (62.5%, n=10) also listed telephone supported by printed document(s) for this handover situation.

Table 13: Modes of clinical handover

Inter-hospital		
Mode	**n**	**%**
Verbal face-to-face only	11	68.75%
Verbal face-to-face supported by printed document(s)	10	62.5%
Verbal face-to-face supported by IT-based look up of the EPR	3	18.75%
Verbal face-to-face supported by IT-based look up of lab reports	6	37.5%
Verbal by telephone only	5	31.25%
Verbal by telephone supported by printed document(s)	8	50.0%
Written only based on EPR printout	1	6.25%
Written only based on handwritten notes	5	31.25%
Written only based on patient medical notes	4	25.0%
IT-based only using facsimile (Fax)	1	6.25%

Inter-departmental		
Mode	**n**	**%**
Verbal face-to-face only	13	81.25%
Verbal face-to-face supported by printed document(s)	11	68.75%
Verbal face-to-face supported by IT-based look up of the EPR	1	6.25%
Verbal face-to-face supported by IT-based look up of lab reports	7	43.75%
Verbal by telephone only	7	43.75%
Verbal by telephone supported by printed document(s)	7	43.75%
Written only based on EPR printout	0	0
Written only based on handwritten notes	5	31.25%
Written only based on patient medi-cal notes	6	37.5%
IT-based only using facsimile (Fax)	1	6.25%

Intra-departmental (shift handover)		
Mode	**n**	**%**
Verbal face-to-face only	16	100%
Verbal face-to-face supported by printed document(s)	12	75.0%
Verbal face-to-face supported by IT-based look up of the EPR	3	18.75%
Verbal face-to-face supported by IT-based look up of lab reports	9	56.25%
Verbal by telephone only	4	25.0%
Verbal by telephone supported by printed document(s)	3	18.75%
Written only based on EPR printout	1	6.25%
Written only based on handwritten notes	5	31.25%
Written only based on patient medical notes	4	25.0%
IT-based only using facsimile (Fax)	0	00.0%

Inter-professional (escalation of care)		
Mode	**n**	**%**
Verbal face-to-face only	15	93.75%
Verbal face-to-face supported by printed document(s)	11	68.75%
Verbal face-to-face supported by IT-based look up of the EPR	3	18.75%
Verbal face-to-face supported by IT-based look up of lab reports	6	37.5%
Verbal by telephone only	8	50.0%
Verbal by telephone supported by printed document(s)	10	62.5%
Written only based on EPR printout	1	6.25%
Written only based on handwritten notes	3	18.75%
Written only based on patient medical notes	5	31.25%
IT-based only using facsimile (Fax)	0	0.00%

2.6 Summary of findings from the national survey

A national survey of the nineteen stand-alone maternity hospitals and co-located maternity units in Ireland involving a short self-report questionnaire provided empirical information on methods and systems of communication and clinical handover in Ireland's maternity services. The response rate of 84 per cent (n=16) indicates that the sample represents the majority of maternity hospitals and co-located units in Ireland. Additionally, the profiles of the sample, in terms of size, levels of activity and staffing, confirm this representativeness. The information provided in the returned

questionnaires was complete for the most part, although some respondents returned incomplete information in respect of a number of categories and items related to organisational policy.

The vast majority of the hospitals/units considered 'handover' to be a high-risk activity and, while the majority also reported having a written local policy to guide professional communication, in general, few had a written local policy specifically to guide the practice of clinical handover. Most hospitals/units had a local multidisciplinary committee with responsibility for issuing clinical guidelines based on up-to-date published evidence.

Few of the hospitals/units reported that staff routinely undergo training in communication practices specific to handover and just one hospital/unit reported that staff training pertaining to handover was compulsory for all grades of clinical staff. Hospitals/units provided limited information in returned questionnaires on the staff grade types who routinely attend training in communication practices specific to handover.

The hospitals/units also provided details of their information technology infrastructure. Just half of the hospital/units reported having an electronic patient record (EPR) system to maintain information on each patient admitted. However fewer than one third reported that clinical staff used the EPR to look up information about patients and just two hospitals/units reported that clinical staff routinely used the EPR to support clinical handover. Most of the hospitals/units reported that, in addition to the EPR system, there was an IT 'look up' system, with which clinical staff could access patient information and, when asked to indicate the name of the system, the National Integrated Medical Imaging System (NIMIS) was listed most frequently, followed by *Integrated Patient Management (Information) System (IPMS/IPMIS). Up to forty individual IT look-up systems were named.*

The hospitals/units also reported on their clinical handover practices, with reference to the process, the personnel involved, the location and the use of handover tools to support handover. All of the hospitals/units reported that duty shift handover was routinely conducted in all clinical departments and the majority also reported that shift handover was mainly conducted on a team basis and that attendance was mandatory for all oncoming staff. However, fewer than half of the sample reported that shift handover was mainly conducted with both midwives and doctors present. The duty shift handover was mainly conducted away from the bedside. Just half of the sample reported using a single approved handover tool to support clinical handover and the tools listed included 'Excel file' 'ISBAR' and 'safety pause'. Additionally, of those that used a handover tool, half reported that the tool was *not* routinely used by all health professionals involved in clinical handover and no hospital/unit responded that the handover tool was routinely used by all health professionals involved in clinical handover.

The hospitals/units also reported on their handover practices in relation to location, staff grades, modes of handover and tool(s) in use to support handover in respect of four distinct handover scenarios: inter-hospital, inter-departmental, duty shift handover and escalation of care. The ward office or ward station was the most commonly-reported location for clinical handover for inter-hospital and duty shift handover, while the bedside was the most commonly-used location for inter-departmental handover and handover for escalation of care. However the majority of hospitals/units also listed the ward office and ward station as locations for handover in escalation of care.

Hospitals/units also reported on the staff grades who routinely attended handover in the four handover scenarios. For the majority of hospitals/units, both medical (registrar, senior house officer) and midwifery grades (staff midwife, clinical midwife manager) attended inter-hospital and inter-departmental handover and handover for escalation of care. Over half also reported that the consultant attended handover for escalation of care. In respect of duty shift handover, most respondents reported that the staff midwife and clinical midwife manager attended and

over half reported that the registrar attended. Few of the respondents reported that the student midwife attended any of the fours handover scenarios.

The hospitals/units also reported on the handover tools in use to support handover in the four handover scenarios. The majority reported that the ISBAR tool was used for inter-hospital, inter-departmental handover and escalation of care and for duty shift handover. Half of the respondents reported use of the National Maternity Chart for duty shift handover and a small proportion of the sample also reported using SBAR, IMEWS and an EPR-generated tool in some handover situations.

Respondents were asked to indicate the principal modes of clinical handover used by clinicians in the four handover scenarios and were presented with a list of all the possible methods, either singly or in combination. Respondents indicated several clinician-to-clinician modes of communication for each of the four handover situation categories.

The most commonly-used modes of communication for clinical handover in all four scenarios were verbal face-to-face only and verbal face-to-face supported by printed documents, such as EPR printout or lab printout. Several other modes of communication were also reported, including verbal face-to-face supported by IT-based look up of lab reports, telephone supported by printed document(s) and the use of telephone only.

3 FINDINGS: NON-PARTICIPANT OBSERVATION

3.1 Introduction

A total of 10 clinical handover events were observed in three Irish maternity hospitals, as follows: 3 observations were conducted in stand-alone maternity hospitals and 7 occurred in co-located maternity units attached to general hospitals. The total number of participants involved in the 10 observed events was 88 (Table 3.1).

Table 3.1 Non-participant observation of clinical handover

Event observed	Setting	No. of events	No. of participants
Handover	Maternity Hospital	3	35
	Maternity unit in general hospital	7	53
Total		**10**	**88**

3.2 Location of handover and purpose

Ten clinical handovers were observed at various locations within the hospital setting. Three handovers occurred at the patient's bedside, 5 took place in a closed office setting, 1 occurred at an open ward station and 1 in a corridor during inter-hospital transfer (Table 3.2).

Table 3.2 Clinical Handover Observed Location

Table 3.2: Non-participant observation of clinical handover			
Event observed	**Location**	**No. of events**	**No. of participants**
Clinical handover	Bedside	3	31
,,	Closed office setting	5	39
,,	Ward Station	1	10
,,	Entrance or exit to department or ward	0	0
,,	Other	1	8
Total		**10**	**88**

Of the 10 clinical handovers observed, 2 involved an admission, discharge or transfer of a woman, 2 involved a consultant-led round, 2 involved inter-department escalation of care, 1 an intra-department transfer and 3 involved change of duty shift (Table 3.3). As Figure 3.1 illustrates, the majority of handovers occurred in a closed office, followed by the patient's bedside.

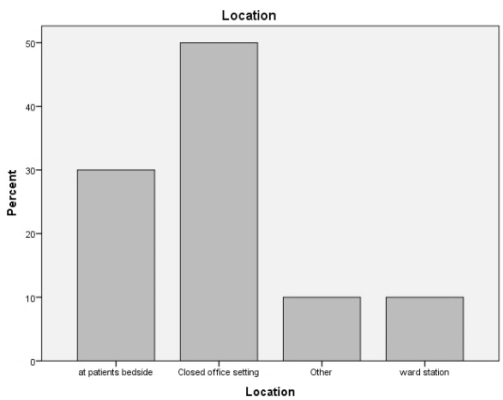
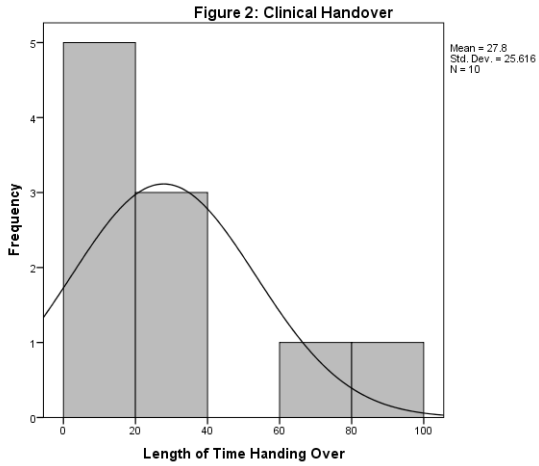


Figure 3.1 Location of clinical handover

Table 3.3 Clinical handover events			
Event observed	**Location**	**No. of events**	**No. of participants**
Clinical handover	Admission, discharge, inter-hospital transfer	2	18
,,	Change of duty shift	3	33
,,	Consultant led round	2	25
,,	Escalation de-escalation of care	2	10
,,	Intra-department transfer	1	2
Total		**10**	**88**

3.3 Duration

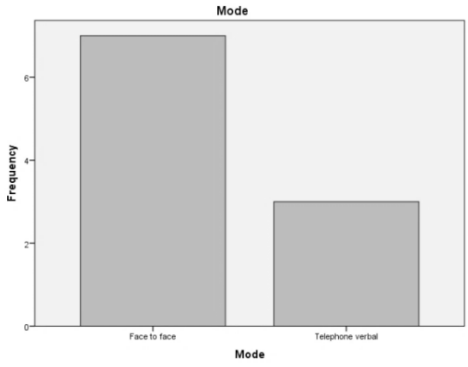
The duration of the time required to institute handover took from 5 minutes up to and including 2 hours. The duration of the actual handover events varied. The shortest handover observed was for escalation of care lasted 3 minutes. The handover of the longest duration was 1 hour 20 minutes; the event was change of shift handover involving a multidisciplinary team (Figure 3.2).



n=10

Figure 3.2 Duration of clinical handover

Figure 3.3 illustrates the two principal modes of clinical handover: face to face, the most common mode, (n=7) and telephone (n=3).



n=10

Figure 3.3 Mode of clinical handover

In cases where clinical handover took place at the bedside, there was no observed time delay between completion of clinical handover and engagement in patient care; however, in other instances a mean time delay of 25 minutes from completion of handover to engagement in care was observed.

3.4 Personnel

The personnel involved in clinical handover varied depending on the event type. This ranged from two midwives in a one-to-one handover situation to 20 in a large multidisciplinary team meeting (Table 3.4). The members of the multidisciplinary teams observed included: obstetrician, specialist registrar, senior house officers, medical students, neonatologist, paediatrician all grades, midwives all grades, dietician, microbiologist, and ultra-sonographer. Multidisciplinary teams observed at handover did not include radiologist, pharmacist, physiotherapist, social worker or healthcare assistant.

Table 3.4 Clinical handover events

Event observed	Personnel	No. of events	No. of participants
Clinical handover	Consultant Ward Round	1	5
,,	Midwife one to one	1	2
,,	Midwife team	2	17
,,	Multidisciplinary Team	5	62
,,	Other	1	2
Total		**10**	**88**

3.5 Tools and content

The ISBAR mnemonic tool was used in 3 of the 10 observed clinical handovers, twice during multidisciplinary handover and once during escalation of care. All three observed instances of use of ISBAR occurred in co-located maternity units in general hospitals. Other tools used during observed clinical handover included Excel sheets, medical notes, ward diary, white boards, electronic medical record or a combination two or more of these methods. The content of information communicated during the observed handovers varied; however, the plan of care for the oncoming duty shift was discussed at all ten handovers. The content of handovers is summarized in Table 3.5 below.

3.6 Interruptions attendance and read back

Interruptions occurring during handover occurred in 9 of the 10 observed handover events. A total of 57 interruptions occurred in 9 handovers. One handover was uninterrupted for the purpose of escalation of care. The mean number of interruptions was 6 and the maximum observed interruptions in one handover event was 15.

The attendance at each handover events was observed. In 3 events full attendance of all personnel present was maintained for the full duration of the handover. In 7 clinical handovers 11 personnel left the clinical handover in total; this number ranged from 1 to 3 personnel. Read-back occurred in 9 out of the 10 handovers and did not occur on the one occasion when the event was interrupted for escalation of care. The mean number of times read back occurred was 5.

Table 3.5 Clinical handover content

Information Shared	Communicated	Not communicated	N/A
Admission details	9(90%)	1(10%)	
Biographical details	6(60%)	4(40%)	
Obstetric history	9(90%)	1(10%)	
Antenatal details	9(90%)	1(10%)	
Intrapartum details	7(70%)	0(0%)	3(30%)
Mode of birth	5(50%)	1(10%)	4(40%)
Mother's postnatal progress	4(40%)	0(0%)	6(60%)
Neonatal postnatal progress	5(50%)	0(0%)	5(50%)
Biochemistry	6(60%)	4(40%)	
Haematology	9(90%)	1(10%)	
Bacteriology	3(30%)	7(70%)	
Histopathology	4(40%)	6(60%)	
Radiology / Ultrasonography	6(60%)	4(40%)	
Pharmacology	6(60%)	4(40%	
Emotional status of mother	4(40%)	6(60%)	
Next interval plan of care	100(100%)	0(0%)	
Organisational matters	7(70%)	3(30%)	

3.7 Summary of from non-participant observation

Ten clinical handover events were observed in three Irish maternity hospitals, as follows: 3 in stand-alone maternity hospitals and 7 in co-located maternity units attached to general hospitals. A total of 88 participants were involved in the observed handover events. A variety of handover events was observed, including change of duty shift, admissions, discharges and transfers of patients, escalation of care and consultant-led rounds. Most handovers involved face-to-face communication, although a small number involved telephone handover.

Half of the handovers took place in a closed office setting, or in a small number of cases, at the patient's bedside. The duration of handover events varied, with the shortest handover, for escalation of care, lasting 3 minutes and the longest duration, a multidisciplinary duty shift handover, lasting 1 hour and 20 minutes. The personnel involved in clinical handover varied depending on the event type and this ranged from two midwives in a one-to-one handover situation to 39 in a large multidisciplinary team meeting.

The ISBAR mnemonic tool was observed in just three of the ten observed handover events, twice during multidisciplinary handover and once during escalation of care. Other tools observed in use during handover included Excel sheets, medical notes, ward diary, white boards, electronic medical record or a combination two or more of these methods. The content of information communicated during the observed handovers varied; however, the plan of care for the oncoming duty shift was discussed at all ten handovers. Among the content topics communicated at handover included background information like admission and biographical details, obstetric history, inter-partum and antenatal details and mode of delivery. Other clinical details communicated included haematology, bacteriology and histopathology reports. All events included discussion of the next interval plan of care and most included mention of organisational matters.

Interruptions occurring during the handover events were observed in 9 of the 10 events, with a total of 57 interruptions occurring. The mean number of interruptions was 6 and the maximum observed interruptions in a single handover event was 15. In 3 of the handover events full attendance of

all participating personnel present was maintained throughout the handover, while in the other 7 events, some personnel did not remain for the full duration. Read back was observed in 9 out of the 10 handovers.

4. FINDINGS: FOCUS GROUP DISCUSSIONS AND INTERVIEWS

4.1 Introduction

Data obtained from the focus groups and individual interviews were analysed using thematic content analysis in order to permit the extraction of emergent themes in the data. Content analysis involved a modified multi-stage approach to analysis, involving the identification of preliminary categories, reaching consensus on categories, allocating category and detail codes, and merging and re-allocating details. The overall outcome of this analytical process is presented here as a narrative of emergent themes supported with exemplary extracts from the data. In developing the field work designs, the focus was on recruiting informants who were representative of practitioners engaged directly or indirectly in clinical handover. The aim of was to generate information through self-reports and discussions, in order to understand the range of experiences of those who were engaged in clinical handover, including their perspective on their own practices and the factors that influenced the conduct and content of clinical handover. Data for this element of the study was generated through the interview method and focus group discussions.

A total of 20 interviews and 12 focus group discussions were conducted. These included 7 interviews with midwives, 8 with medical personnel and 3 with other healthcare professionals (Table 4.1). For the purpose of data analysis, the data from the interviews and focus groups were analysed as a single data set.

Table 4.1 Focus groups and interviews

Data collection type			
Focus group	**Grade**	**No. of events**	**No. of participants**
	Service user/women representatives	2	11
	Student midwife	2	18
	Staff midwife	2	15
	Clinical midwife managers	2	12
	Mixed grade midwives	3	21
	Clinical Advisory Group Obstetric Gynaecology	1	9
Total		**12**	**86**
Interview	**Grade**	**No. events**	**No. participants**
	Director/Assistant Director of Midwifery	6	6
	Consultant obstetrician	3	3
	Specialist Registrar/Registrar	3	3
	Radiologist	1	1
	Microbiologist	0	0
	Senior House Officer/Intern	0	0
	Medical student	1	1
	Theatre nurse	1	1
	Pharmacist	1	1
	Physiotherapist	1	1
	Social Worker	1	1
	Dietician	1	1
Total	Healthcare Attendant	1	1
Total		**20**	**20**
Overall total		**32**	**106**

During the interviews and focus groups participant spoke about their everyday experiences of conducting clinical handover. While discussions were guided with the use of a topic guide, both the interviews and focus groups generated a large body of rich narrative data on the topic of clinical handover. The participants talked about a range of situations in which they conducted clinical handover, their organisation's policies on handover, their own practices and the wider context in which clinical handover occurred. The data offered rich and detailed information, which was reduced and categorised into two broad themes, each with a number of sub themes, as set out in Figure 4.1.

The three major themes and their associated subthemes describe the participants' accounts of the various local policies and practices that obtain in both the large maternity hospitals and the smaller co-located units. These accounts described organisational policy and training, handover practices for a variety of scenarios and tools used to support handover and as well as barriers to effective handover. The third theme describes service users' accounts of their experiences with reference to their role in clinical handover, including bedside handover.

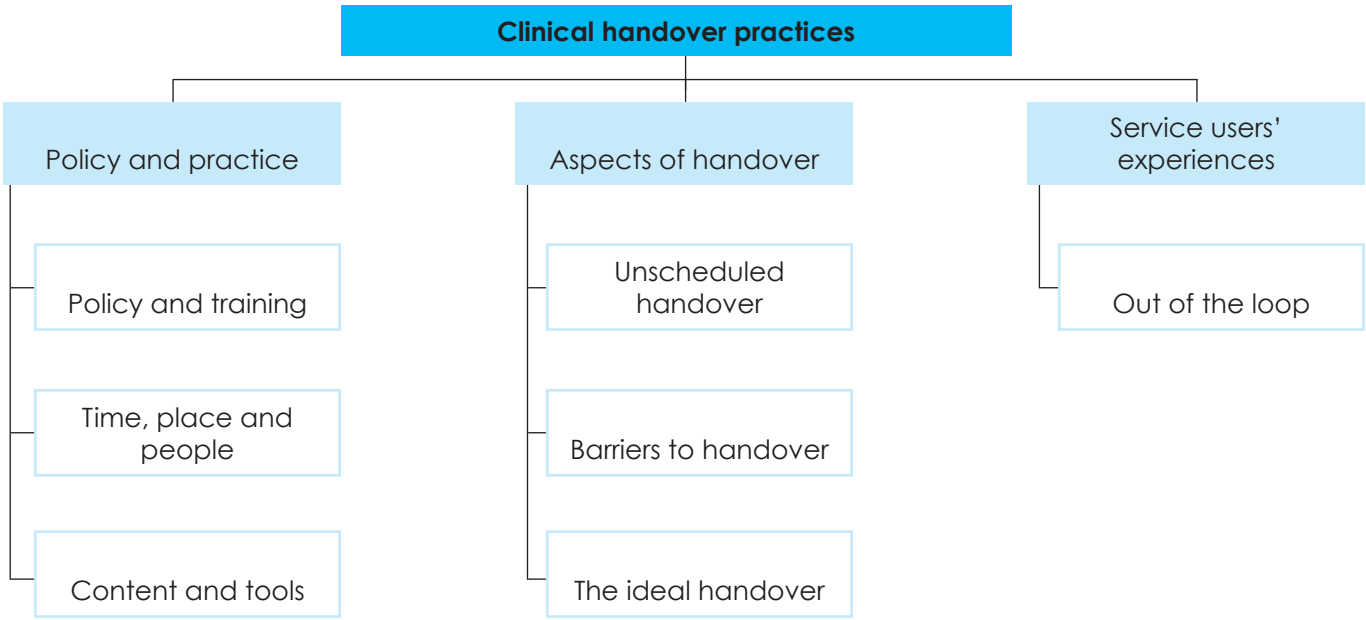


Figure 4.1 Findings from interview and focus group data: Themes and subthemes

4.2 Theme 1: Handover policy and practice

Overall this theme describes the accounts and reports from the full range of informants who participated in interviews and focus groups and the theme describes the participants' accounts of local policies and practices in relation to clinical handover. The theme comprises three sub-themes, as follows: policy and training; time, place and people; and content and tools.

Policy and training

Participants described organisational policy in relation to clinical handover. For the most part, their accounts indicated that there was little formal policy regarding the way that clinical handover should be conducted and little formal training specifically in relation to clinical handover. Where it was described, participants referred to the timing and the personnel involved in clinical handover. One Director of Midwifery described the requirement for clinical handover to be multidisciplinary so that the process is 'formalised … [and] ensures that they are present [and] it also cuts out repeated reporting throughout the morning'. The same director also described a sign-in policy for recording attendance at handover:

> We have also a system in place whereby everybody present on report must sign the day book so on a three monthly basis we will audit this and if there are whatever issues with regard to people not turning up we have the information there (Director of Midwifery)

A senior physiotherapist reported 'an absence of a local handover policy', but identified handover as being included as part of the induction process for new physiotherapy staff. A clinical midwife manager referred to the fact that, within her organisation, the ISBAR tool was being 'promoted hugely … specifically for the use of interdisciplinary reports and requesting urgent reviews and handovers on telephones between medics and midwifery staff' (Clinical midwife manager 3). She also described 'a [policy] document on the labour ward for emergency, for how to get people in in an emergency, where they should be, how to communicate and that kind of thing'.

A Director of Midwifery described the genesis of local policy on handover: '[We] have a weekly governance meeting at which everyone attends … the consultant obstetricians, all the registrars and the interns and as many midwives as possible, [and] we use that structure to assist in professional development and that is where this handover policy arose from. Another Director of Midwifery remarked that there was 'a general rule around the place that you don't go transferring a patient during report time'. A Consultant Radiologist described the introduction of a 'new standard reporting handover system':

> Following a couple of years' commitment, planning and hard work, there was training and education locally, but it is a simple application and easy to use. Training involved detailed 'Super user' training and local training involved only twenty-minute training sessions at work.

When discussing policy, many participants also referred to the training in place to support local policy on handover. While most participants indicated that there was no formal training specific to clinical handover practice, those that described training referred to the routine training opportunities that arise in the course of clinical grand rounds, perinatal meetings, maternal morbidity meetings, care pathway meetings, and so forth. Others described journal clubs and a research interest group that meets 'to discuss whatever is relevant to midwifery; it is not specifically to handover' (Director of Midwifery). A senior physiotherapist described 'regular in-house training and reflection using individual case studies' and also stated that 'added external training is always self-funded and in our own time'. A Director of Midwifery described efforts to ensure more effective communication, both within and among interdisciplinary teams:

> We are trying to change our practice because on evaluation it is not actually working and there is break down in communications … that has been identified through incidents and risk assessments. So, basically, what we are doing now is that we have a dry run basically in the office with the board and the midwives. The four teams, someone from one of the teams is available to do that handover. So there is just one to one communication then from the consultant's team to the midwives. Then the teams go out and visit their patients after that (Director of Midwifery).

A small number of participants described training in the use of handover tools, specifically ISBAR and IMEWS. One clinical midwife described going to each clinical area 'with a PowerPoint presentation and [we] tried to capture as many staff as we could to provide training on ISBAR' and another midwife mentioned 'a video on handovers'. A Director of Midwifery described running 'a number of sessions and documentations'. A healthcare assistant reported that she had received 'nothing at all' in continuing professional development.

Time, place and people

Much of the interview and focus group data contained rich accounts of local handover practices occurring within the hospitals and units sampled. These accounts described the times of handover, and locations in which handover occurs and the personnel typically involved in the

various handover scenarios that arise in the course of everyday practice. The accounts were nuanced and provided differentiated descriptions of types by time, place, and purpose. This included detailed information on aspects of handover like the precise timing and duration of handovers, the range of personnel involved and the modes of communication.
One clinical midwife manager succinctly defined the two main elements of clinical handover in the following way:

> On a very basic level the handover is what happens in the morning between teams going on and going off and the same at night. But I suppose what is also part of that is the transfer of accountability and responsibility. So that is probably a bit lost in the word 'handover'. So it is handover of care, handover of accountability, and hand over responsibility (Clinical midwife manager 3).

Several participants spoke about the timing of duty shift handover. Most described a scheduled event for morning and evening shift handover, the former usually occurring at either 7.30am or 8.00am and the latter, the evening handover, typically, at 8.00pm. In some situations there was no obvious overlap of healthcare professionals, as a senior physiotherapist described handover as 'simply reading a communication diary'. Several participants also spoke about handovers occurring during the afternoon, for example at 12.30pm or in the early afternoon, when additional staff come on duty. A small number also described holding short handover meetings for the purpose of taking stock of the situation on a clinical department. For example, one consultant obstetrician referred to a mid-afternoon meeting that was 'not a safety pause … [but] just a quick handover' and a Director of Midwifery described: 'a mid-afternoon round … [a] kind of a collection at around 3:00 or 3:30pm before the CNM2 goes off duty, just to find out what is done, what is yet to be done, who is doing it so that responsibilities are carefully delegated before the CNM2 goes off duty'. A clinical midwife manager 2 (CMM2) described the use of 'a safety pause at 12:00 midday every day on the ward where we go through the board where all the patients' names are and it takes five minutes and every situation is updated, everyone who is waiting for tests, waiting for theatre'. One staff midwife similarly described a ward-level handover as occurring 'at different times during the day when there is a need to update and particularly if you are going off the ward, an early shift and you have a late shift coming on'.

A Consultant Radiologist observed that the timing of handover was dependent on 'the scenarios presented in radiology such as: a critical report (requiring attention within one hour), an urgent report (requiring attention within 24 hours) or a clinically significant and unexpected finding which needs elective follow up, and the issuance of a standard report' . The Consultant went on to state that 'our standard is to communicate critical and urgent findings verbally or face to face with a consultant clinician, [but] where they are not contactable, occasionally a text, fax or telephone call occurs'.

Several senior midwifes also described morning and evening handover between the duty midwifery managers on day and night duty. These handovers typically occurred in the midwifery manager's office at 8am and 8pm. Some participants also spoke of 'transfer of care' handover and handover for the purpose of escalation of care. A clinical midwife manager described the 'senior midwife report', which was submitted from the clinical department to the office of the 'operational' duty manager, and which contained information on 'patients of interest … stuff about patients that are important … or how many staff are on duty and things like that'.

Other opportunities for staff to meet and discuss either specific patients or wider operational issues were also mentioned; these included the use of 'a continuing medical education session that lasts for about an hour and a half'. A Consultant Obstetrician described handover among the multidisciplinary team as occurring 'after grand rounds and involving all consultants, neonatologists and midwives … and all the outgoing teams who aren't on call for the weekend will hand over their patients formally patient by patient'.

In addition to the timing and purpose of the various handover events described, many participants described the location of the handover and the personnel involved. Locations for clinical handover were variously listed as: 'in a private area', 'at the board', at the nurses' station on the labour ward, in the induction room, in the HDU, in the parenting room and in 'the main CNM's office'. A small number mentioned handover at the bedside of a clinical department or in the patient's room; for example, a Consultant Obstetrician described medical handover as occurring 'face-to-face in the room'.

Several participants made a clear distinction between midwifery and medical or 'doctors' handover', and some indicated the timing of this latter handover as taking place at 9.00am. Others distinguished between handover among clinical midwives and handover among midwife managers, with one participant referring to a 'separate handover' for managers. This distinction was particularly evident in reports of the personnel involved in duty shift handover. Hence, change of duty handovers for midwives typically occurred in the morning and evening and were associated with handing over the care of all the patients on the unit from the outgoing to the incoming team of midwives. Many reported that the clinical midwife manager attended duty shift handover events. While one hospital reported including the care assistant grade in handover, others indicated that the care assistant was not included. One healthcare assistant who was interviewed spoke of not being present at handover and not receiving a verbal handover, even after the midwifery handover was completed:

> There is nothing [handed over] to me. I kind of seek that information myself. Nobody communicates to me, never … [and] I have to keep asking. Usually we are communicated to when nobody else will do the job. That is basically the end of the line; if there is nobody else to do the job they will definitely remember our name (Health care assistant).

A number of participants mentioned the mother's participation; one midwife stated that the mother 'gets introduced to the [oncoming] midwife that is taking over' and another described the mother's participation in the following way: 'if she is in the bed and you are standing by the bedside she would be part of it'. Another clinical midwife was less equivocal in stating that 'the patient is very much included' in the handover and a Director of Midwifery indicated that the 'patient' was included in midwife-to-midwife and obstetric team-to-midwife handovers. Involving the mother and her partner was seen as important, particularly at the time of discharge when the midwife 'would sit with mum and partner, one to one, and go through everything in the [discharge information] pack with mum'.

The personnel involved in clinical handover also depended on the way that the care team was deployed on any given shift. Hence, a clinical midwife manager 3 (CMM3) described 'dividing the ward in three … and each person specifically hands over their own caseload' in order 'to make it more efficient handovers'. A Director of Midwifery described her initiative to align individual midwives with individual obstetric teams for the purpose of communication and handover:

> [What] I plan to do is ... to link a group of midwives, approximately between six and ten midwives to each [obstetric] team … so they work in a team and as part of that team [and] the consultant gets to know their midwives and builds up a confidence with their midwives (Director of Midwifery).

Other arrangements for handover, which described the personnel involved, included 'midwife to midwife', 'the obstetric team to the midwife', 'consultant to consultant' and 'healthcare attendants, student nurses and general nurses'. For medical handover, according to one Consultant Obstetrician, the personnel involved were listed as 'the consultant, the NCHDs and the shift leader [who] sees every patient and every patient's midwife' (Consultant Obstetrician). This same Consultant Obstetrician described how handover was incorporated into medical continuing professional development meetings:

> And we have a presentation which is either our audit or perinatal stats or an education session. So there are usually one or two presentations from the team of an educational nature or audit or perinatal morbidity [or] fatality statistics. And then after that we do handover and it is called 'handover'; we say: 'can we do handover now?' And each of the registrars who is responsible, the senior registrars in every firm who are responsible for each team's patients will stand up and talk about their in-patients on a patient-by-patient basis. So that the neonatologists, the on-call [obstetric] team for the weekend, and the consultant team for the weekend know what is in the house, what is complicated, how many beds we need, who is going to be problematic over the weekend, who might need delivery, that kind of thing (Consultant Obstetrician).

The Consultant also described 'a team system' of consultant cover, which gave rise to the particular practice of consultant-to-consultant handover, whereby 'one consultant will cover the ward for the whole week and we only really take handover in that case on a Monday morning because we then cover the ward for a week so we know the patients on a day-by-day basis'. Another Obstetric Consultant described consultant-to-consultant handover in the case of 'anything very specific or urgent' as follows:

> The consultant on overnight [call] would also be present [at handover], but usually a phone call between the two [consultants] sorts out the communication of anything that needs to be reviewed. So the consultant is on [call], his or her registrar is on and the SHO or intern (Consultant Obstetrician).

The location in which the handover occurred also determined the personnel involved. Hence, for handover in the 'gynae ward … everybody would be there … medics, [the] healthcare [assistant], she will be there'. In the postnatal ward, according to one clinical midwife, the midwifery handover involved midwifes handing over 'one to one'. In one hospital, the labour ward personnel involved in handover included:

> The obstetric team on call for the labour ward for that day and for urgent cases, the consultant on overnight [call] would also be present … [and] the CNM on duty and the team of midwives for the labour ward for the day (Director of Midwifery).

The arrangements for managing cases in the labour ward also implied the personnel involved in handover, as one participant explained:

> We have one-to-one care in labour ward; every single individual patient's midwife will be involved in that as well. So if they are completely normal labours we normally just go in and say 'hi'. But if they are complicated then we do whatever we need to on the round (Consultant Obstetrician).

Content and tools

Participants spoke about the content of handover reports and the tools in use to support and augment handover. The data indicated that the content depended on the purpose of the handover, the setting and the personnel involved. Where a handover involved the transfer of care of an individual woman, 'everything pertinent to the case' was communicated. Many participants indicated that clinical handover content included information relevant to the oncoming team, such as 'all the clinical details, all the relevant obstetric and intrapartum care [and] information about each patient'.

The content of handover differed somewhat between day and night duty shift handover. At the evening shift handover, content generally included 'information regarding what has occurred during the day'. Duty shift handover involved night staff handing over to the day staff and this could involve teams handing over to teams: 'each one of them would hand over their women to the day staff coming on, mothers and babies'. One clinical midwife manager indicated that

duty shift handover content was determined by her own perceived information needs in relation to the patients in her care: 'as morning time ward managers, [we] would have given the specifics of what we want in the handover.' Morning duty shift handover generally included 'an overview of the activity during the night' and was also determined by the needs of the oncoming obstetric team, as one clinical midwife explained:

> If you have an incoming consultant who is going to be on for the day, they [need to] know who are the women who really need to be seen now, plans of care, decisions made early in the day rather than suddenly transferring, or whatever the case may be, at 4:00 in the evening. So you get that alert very early in the day. On some wards they have an alert [and] we have a patient with diabetes or whatever, so it gives you that over view of who is a priority case (Clinical midwife).

A Consultant Anaesthetist described handover in theatre and high dependency units as 'being very precise [and] guided by clear, concise checklists and documentation to hand with laboratory findings available on screen'.

Handover content was also determined by the type of clinical department involved. For example, in the antenatal department, handover was guided by the booking summary, which included information on 'age, BMI, gravida parity, due date … [and] her main notes', containing a review of 'progress to date'. In the postnatal department content included additional postpartum-specific content, as one clinical midwife summarised: 'We have a sheet with the patient's name … mode of delivery and whether she is breastfeeding and the sex of the baby and … the important things'. A theatre nurse discussed the practice of ensuring 'clear handover of clinical information in theatre from check in right through to recovery'. She went on to describe the internal quality control processes to ensure that the information being communicated was relevant:

> We have a booklet check list in theatre [with] a lot of clear detail, all needed and we audit this every year to tweak it; we are very happy with it. It includes safety pauses, pain scales and risk ratios (Theatre nurse).

The level of detail provided at handover also depended on the grades involved in receiving the handover and on the setting in which handover occurred. For handover reports involving duty managers, the information communicated related largely to operational matters, as one Director of Midwifery explained: '[we need to know] the number of patients are there, what empty beds are there, what is the workload, how many sections, how many forceps delivery'. The same Director went on to describe the content of handover as follows:

> Obviously [it is] not in the same detail as [that] the people in the clinical area will have, but it is just a brief overview of how sick the people are, the women that are down there … our focus really would be on is number 1: the acuity, and number 2: the staffing of the particular area (Director of Midwifery).

A CMM3 mentioned receiving 'an overview of all the areas', as opposed to detailed handovers of individual patients. Similarly, a staff midwife referred to handing over '[only] the important things' to the duty midwife manager, so that she obtains 'an oversight of the whole ward, [since] they are not going to have an in-depth report … they will just get the succinct issues (clinical midwife). Hence, in addition to operational matters like the number of admissions, most senior midwives, acting as duty managers, spoke about the need to have information on particular cases of mothers or babies who were unwell, including 'anyone they are worried about for any reason'.

The participants also spoke about the handover tools and other documentary and electronic supports that were commonly used in clinical handover. The tools and supports described were used to either augment verbal reporting and to guide the content of verbal and/or telephone

reporting. In this way they determined much of the content that was handed over. The range of reported tools and supports included the ISBAR tool, a mnemonic topic standardisation tool used to aid recall of information categories, and various printed documents generated by IT systems.

The interview and focus group data suggest that the ISBAR mnemonic is used quite extensively across both large hospitals and smaller co-located units, but that it is used in particular clinical handover situations, notably for escalation of care, theatre handover, and for telephone handover. A clinical midwife manager reported that while ISBAR was not used for scheduled handover it was used 'everywhere for escalation' and a staff midwife mentioned its use with multi-disciplinary group handover. Another midwife indicated that the ISBAR was used 'if we have concern regarding a patient' and went on to say: 'we use the ISBAR to call the clinician and we document it and we keep a record of it in the chart'. Additionally, in one hospital it was reported that the tool was being used as a means of supporting the teaching and assessment of midwifery students in relation to handover of care. For example, one Director of Midwifery reported that the ISBAR tool had begun to be used in her organisation following the introduction of IMEWS and another Director of Midwifery reported on her organisation's efforts to integrate the ISBAR into everyday clinical handover:

> We use ISBAR to handover as well and we have had a lot of conversation around how we can amalgamate the ISBAR into the handover … So what we have agreed to do is during the day when the midwife is actually writing up her notes she is referring to the ISBAR, that she has each category covered. And at handover, when she is reading her handover, the midwife that she is handing over to is beside her … [and] using ISBAR to midwife whoever. And the other midwife then signs. So that is something that we are ongoing trying to [achieve] (Director of Midwifery).

Several participants mentioned 'the sticker' in connection with the ISBAR tool. Focus group participants at a number of hospitals and units also discussed the use of ISBAR. One staff midwife referred to its use as part of a 'standard operating procedure' (SOP) for the morning handover:

> We have the ISBAR sticker now as well and that is if you are handing over … we have the morning handover SOP, but then we have an ISBAR sticker as part of the SOP that we put in the chart if you contact somebody to say we have a deteriorating patient, so that you have a proper communication tool with the person you contact (Staff midwife).

A number of participants indicated that the ISBAR tool was relatively new or had the status of a pilot tool; one staff midwife remarked that the introduction and use of ISBAR was 'a work in progress' and another spoke about the tool as being 'in its infancy' within the organisation. A clinical midwife manager observed that the ISBAR tool was 'quite new' and a consultant obstetrician remarked that the ISBAR, while available, was 'not being practiced … that often' in maternity services. This was particularly evident in relation to the use of the ISBAR sticker, which was not evident in the chart. In one organisation the ISBAR tool was obligatory, with one midwife reporting that the consultant 'insisted that we use ISBAR while we were passing the patient over to theatre staff'. In another organisation, there were efforts to promote its use, as one Director of Midwifery indicated: 'we are encouraging people when they are handing over to use the ISBAR tool'.

Several participants spoke of the benefits of ISBAR as a handover tool. One stated that it was 'very useful' for handover, another declared that ISBAR was 'really the way forward' and a third remarked that the tool 'cuts out a load of the waffle'. Referring to telephone communication, a midwife stated that 'it is good because you have the background and you can pass on the information to the clinician … I suppose that does take a bit more preparation to make the phone call'. Another clinical midwife spoke about the importance of the tool as part of the SOP: 'you definitely need the ISBAR [and] you need the SOP to guide the sticker or the tool that you are using'. One Director of Midwifery spoke about its value in teaching midwifery students:

> We have tried, with students particularly, to get them to focus more on what needed to get communicated … [and] by using the ISBAR tool it helped them to focus in on what was important … the ISBAR tools helps the student. I suppose we have used it for the exams and it just helps them to settle down a little bit and by going through the ISBAR with them they will actually go (Director of Midwifery).

A clinical midwife manager observed that the ISBAR might not be relevant in a smaller hospital, compared to a larger hospital, reasoning that it was more needed in the larger hospital due to 'lots of different people who wouldn't know one another, maybe a lot of locum staff'.

A number of participants also mentioned IMEWS as a companion tool to ISBAR, but indicated their understanding that it was not a handover tool, per se, but a means of supporting communicating in the event of escalation of care, as one midwife stated:

> I think, not related to handover but related to [it], the IMEWS is simply [used to] get a response now from doctors, because prior to this you would be phoning up maybe with some vague symptoms and sometimes you would be dismissed. But now we are able to say we have one yellow, we have two red[s], so it is a useful tool for us to get what we want, which is a review of the patient (Staff midwife).

One midwife reported that the IMEWS was used in circumstances when deterioration of care needed to be communicated, such as 'the middle of the night when they want to just [get] straight to the point' The IMEWS was also reported to be in use 'on all our pregnant population and post natal population', while the NEWS was in use for 'all our non-pregnant Gynaecology women'. A radiologist described the recent introduction of Peer Vue, a new electronic recording system: which, he considered, was 'a new effective handover software system [that … facilitates radiologists to handover reports and also requires clinicians to acknowledge receipt of reports'. The radiologist considered that the use of the tool 'enhances continuity between radiologists and clinicians'.

The use of a whiteboard to supplement verbal communication and handover was widely reported. The whiteboard was used for communicating 'the very basics' in order to ensure patient confidentiality and, in the case of the delivery suite, to communicate 'pertinent key facts', including the names of key personnel on duty. In one organisation it was reported that there was a whiteboard in each room, onto which was recorded 'a brief note, the risks … and a brief outline of their situation, their assessment and their background at the time and if there are any risk factors'. Some reported that the whiteboard was used in conjunction with the patient's chart. While all whiteboards were 'the old fashioned [type] with pen', one Consultant Obstetrician mentioned the imminent introduction of an 'electronic clinical management system … the equivalent to an electronic whiteboard'. A Director of Midwifery similarly reported on her organisation's plans to move to a 'paperless system' for communicating information.

Many participants spoke about the use of documentary information to support clinical handover. These included: 'a printed hand-out [containing] the woman's condition and any complications'; a Word document containing details of 'parity, condition, plan and baby' in postnatal; an 'ongoing record [sheet] in the labour ward'; 'a sheet, all typed in with the patient's [details]'; an Excel sheet; a 'nursing kardex' and the case notes. One participant mentioned the use of Excel, updated on a daily basis by the midwives and printed off for handover. Case notes were also frequently mentioned as a tool for looking up additional information, such the Partogram and blood results. A new 'triage template' for use in the assessment room had been recently piloted in one organisation.

A number of participants made reference to IT-based systems that provided additional information, such as 'a computerised clinical information system', which gave a summary report and a

number spoke about the Integrated Patient Management System (IPMS), from which additional pertinent information could be extracted for use during handover. One clinical midwife manager mentioned having 'the phone app for medical handover'.

4.3 Theme 2: Aspects of handover

This theme describes particular aspects of clinical handover that required practitioners to adapt to unheralded circumstances and/or difficulties with clinical handover. The theme is entitled 'aspects of handover' and comprises two sub-themes: 'unscheduled handover' and 'barriers to handover'.

Unscheduled handover
Many participants in the focus group discussions and interviews spoke about handover practices in relation to unscheduled handover. The most common situations in which an unscheduled handover took place were reported as being when care needed to be escalated, such as a sudden deterioration or when an IMEWS score warranted escalation, and on occasions when a woman was admitted from the assessment room to the antenatal ward or delivery suite. A Director of Midwifery indicated that unscheduled handovers happened 'all the time as patients come in' to the assessment room: that is not formalised, it is happening continually throughout the day'. The Director gave examples of typical unscheduled handover scenarios:

> A midwife will do an assessment on the patient and hand the case over to a doctor if it is not within her remit to deal with the situation … There may be a case where a patient comes in to, for example, a high risk clinic or for assessment in the foetal assessment unit … [and] she will need attention in the labour ward, possible induction or delivery, so handover would take place from the midwife or doctor who has assessed that patient in foetal assessment to the CNM and the midwife going to look after the patient here on the labour ward. And that would just be a verbal report using the information in the chart (Director of Midwifery).

For escalation of care, as in the foregoing examples, unscheduled handovers were generally communicated verbally and, as one clinical midwife manager described: 'verbal and probably very fast'. However, escalation also included the use of telephone referral and written request.

The personnel involved in unscheduled handovers were typically the staff midwife and clinical midwife manager, the senior house officer and registrar and, where warranted, the consultant, as one consultant obstetrician explained:

> [For escalation] the first port of call is usually SHO and [the] SHO calls the registrar and the registrar, if needed, calls the consultant. But there is a clear policy that midwives have the right to ring the consultant straight away rather than going through all this proper channel; there is a policy for that, so that is how we escalate (Consultant Obstetrician).

Unscheduled handover also occurred between outgoing and incoming on-call medical teams, as another consultant obstetrician indicated:

> [We hold] perinatal medicine meeting, perinatal rounds. Every patient who is complicated or is an in-patient will be formally discussed and their care will be handed to the team for the weekend. A private patient who is complicated, they will normally just do an unscheduled phone call … just to handover the patient (Consultant Obstetrician).

The Consultant also explained that in the case of a deteriorating patient, the unscheduled handover demanded the consultant's direct involvement in the case, when handover would take place 'at the patient's bedside face to face':

> If they become critically unwell in between us rounding we would literally just see them, we wouldn't do anything over the phone; we normally would see them because we are in doing deliveries ourselves most of the time (Consultant Obstetrician).

According to a clinical midwife manager 2 (CMM2), unscheduled handovers also occurred in cases 'where patients who [we] would have had concern [about] or unusual outcomes or possible escalation plans of care for the following day' (CMM2). Those present in this latter situation included the outgoing and incoming on-call consultants and their respective registrars and SHOs, and the relevant clinical nurse managers. Similarly, a clinical midwife manager 3 (CMM3) explained that when care was escalated, this 'required more team members to be brought in' and in this circumstance there would be 'a kind of a bit of a handover' using the ISBAR and 'a guidance document about escalation of care'.

While some participants indicated that unscheduled handovers involving escalation of care were verbal only, others stated that the event was recorded, and that the information recorded included 'exactly the information that was given' at the time of handover. Aside from the IMEWS, there was no 'formal tool kit' for escalation, according to one participant. A Director of Midwifery mentioned the use of 'a stamper every time they escalate care' and a clinical midwife described 'a code red system' specific to the delivery suite and theatre, that was used for 'the very significant cases'; the midwife explained that the system was 'a communication tool … that we use up there for a major bleed or something … like a tick box that you have to contact all the right people.

Barriers and enablers

The focus group and interview data provided rich evidence of the everyday experiences of practitioners in a range of handover situations and many spoke about the barriers that they encountered in achieving an effective clinical handover. Among the most frequently-cited barriers were interruptions from extraneous sources during duty shift handover, notably the telephone, and the time required to complete a handover, resulting in fatigue and inattention on the part of participants in the handover process. Some participants also mentioned the non-attendance of key personnel at the handover, due to competing commitments, which could result in repeating the same handover on two occasions.

Many participants saw interruptions in the environment in which duty shift handover took place as a major barrier to effective handover. This was particularly problematic when the telephone rang or when someone outside the handover group interrupted, such as a doctor or a patient, as one clinical nurse manager explained:

> Sometimes, the phone [is] ringing or sometimes a doctor will come in looking for a chart or someone comes in to transfer someone to theatre … an admission could come in (CMM3).

One midwife described the barrier in the following way: 'the desk is absolutely manic. You have visitors coming up, you have phones ringing, you have got staff coming and going and you have got parents or whatever' (Staff midwife). A particular source of interruption in the postnatal ward was the sound of several babies crying. The setting of handover could also limit the amount of information that could be transferred and several participants spoke of the restrictions presented by an open environment, such as the ward station or the bedside, where key information needed to be withheld to assure patient confidentiality.

The time required to complete a duty shift handover was seen as a presenting particular risks to the effectiveness of handover and this was also frequently cited as a barrier. Overlong duty shift

handover reports – 'anything from half an hour to an hour' – were seen as a risk due to 'tiredness, like the night staff are handing over after a twelve-hour shift and then the day staff are handing over after a longer shift' (CMM2). Overlong handover reports were seen as resulting from a number of factors, including the number of cases to be handed over, interruptions and unnecessary and extraneous 'chat' during handover. The time required was also seen as reflecting a lack of ability to prioritise information at handover, as a clinical midwife manager implied: 'she didn't know all the patients and she had to read through everything and she was afraid she would miss something so she was reading through every single thing (CMM3). One Director of Midwifery remarked that an overlong handover report could be 'soul destroying to some of the staff involved', as many wished to 'get rounds started and get activity [going]. One suggested means of overcoming the barrier was to tape record the handover; however, this practice was not widely advocated, as one midwife remarked: 'I personally wouldn't be in favour of this'.

One midwife commented that 'sometimes reports can take forever' and suggested that this impacted on people's ability to concentrate on the material being communicated:

> People finishing a shift don't want to be there all night … you start losing, you know, the people that are taking the report, if it is taking so long you might miss some information or you mightn't be concentrating (Midwife).

A related factor associated with perceived overlong handover reports was the large number of cases that needed to be handed over. One midwife cited an example of a single midwife having to hand over 'a huge caseload of 28 to 30 women'. The number of individuals involved in clinical handover could itself be a problem, as on participant remarked: 'the more people who are involved in communication, the more likely it is to go wrong'.

Staff shortages were cited by both midwives and obstetricians as a barrier to effective clinical handover. For example, two consultant obstetricians cited clinical workload within their respective medical teams as a barrier to effective handover, as one observed:

> The main barrier is just the clinical workload … actually, it can be really busy, and it is not uncommon to arrive at 8:00am, to take the handover at 8:00am and find that the outgoing registrar is doing a delivery and the senior reg. is in theatre and the SHO is in the emergency room and it takes a while to get everyone together (Consultant Obstetrician).

Several participants spoke about the difficulty in meeting with other professionals to conduct handover. A consultant radiologist described the 'difficulty in accessing clinicians' as a barrier, as there were 'no up-to-date standard contact details currently available' for clinicians. A Consultant Anaesthetist (intensivist) saw the lack of available anaesthetist intensivists to handover to, resulting in 'no clear handover of care'. When transfer was 'bed specific' rather than 'intensivist specific', emergency transfers occurred 'only where a bed is available and where [an] interventionist is available'. A senior physiotherapist saw a lack of 'access to midwives' as a barrier; since they were 'too busy to handover to … [it was] more difficult to find a midwife and often women are referred from the ward too late in the afternoon and we are busy with clinics'.

A number of participants also mentioned absent or poor IT infrastructure to support clinical handover as a barrier: 'because we haven't IT [support] we fail in a lot of our communications'. A Director of Midwifery saw inherent risks in the use of electronic information if the information was not updated regularly: 'I don't think they should be depending on that because it may not be updated properly or the midwife didn't get a chance to update it'. The Director also went on to say that the midwife's own written notes could also be a risk. Another Director of Midwifery cited staff resistance to adopt technology as 'a huge barrier', observing:

> Midwives are loath to take on any additional tasks … the midwives don't computerise their own notes and to me that is a huge weakness in our system … I feel when you computerise your own notes, it doesn't take long and … the accuracy is much higher when midwives do it. But I find that there is a resistance around that.

In a somewhat related comment, a clinical nurse manager referred to the organisational culture as a major barrier: 'probably the biggest barrier is the culture of the organisation, the people in it, if they want to be engaged in the process of not' (CNM2).

The ISBAR tool was seen as aiding effective transfer of information; however, it needed to be used consistently and without unnecessary tangential information; one midwife spoke of the need to 'keep it as focused as possible' when using ISBAR: 'I think ISBAR is great … but if somebody starts telling a story in the middle of it … that puts everybody off and you lose track of it then'. Another midwife similarly saw the need for consistency in the use of ISBAR if handover was to be effective: 'I think people cherry pick out of [it] what they think ISBAR is, but we need to make sure that everybody is consistent with using it' (Midwife). Another barrier when using ISBAR was the risk of defaulting into a more traditional way of communicating:

> It can be difficult for people to do for recommendations, that part of it … Rather than saying, the situation is she has a suspicious CTG, you know, they fall back into giving it traditionally and the recommendation then for, you know, it was a challenge because we weren't used to saying: "well I think this lady needs to be delivered, needs to be started, needs to be seen immediately" (Midwife).

Lack of awareness of the major elements of the ISBAR tool was also seen as a barrier to its effective use as a handover tool: 'So when people are aware of the tool they are much more receptive to you explaining it that way because it is a different way of handing over' (Staff midwife).

The ideal handover

This theme describes participants' perspective on what they considered to be the important elements of an effective clinical handover. In speaking about the 'ideal handover' participants provided commentary on what they saw as the way that handover should be conducted to ensure maximum effectiveness.

All midwifery grades believed that handover was a very important process and agreed that handover should be placed 'at a very high level within the organisation' and with an agreed protocol on the conduct of handover. Senior clinical staff also spoke about the importance of clinical handover. A Consultant Radiologist commented that there should be 'buy in' from all stakeholders in the practice of handover, especially clinicians, and remarked that 'information that is deemed urgent should be treated as such'. He also added that it was important to have up-to-date accurate contact lists, so that relevant staff could be contacted when urgent information needed to be communicated. A Consultant Obstetrician identified an ideal handover as one conducted with protected time whereby one obstetric team can talk openly to the other team and in the absence of interference. Another Consultant Obstetrician suggested that, in order to achieve the ideal handover, staff needed to be educated in the proper handover practice and suggested the need for workshops on communication to educate staff and to assist them to learn how to handover specific focused information with clear notes. A Consultant Anaesthetist advocated a clear process of handover when transferring patients out of the maternity services, in which there is 'one phone call, to one lead intensivist, who leads the care, rather than multiple handover calls to hospitals until a bed is identified'.

Participants spoke about elements of the handover process that could be protected, in order to ensure that the handover was conducted according to best practice; these elements included time and location. While several doctors and midwives recognised that typical interruptions to scheduled handover, such as emergency situations, were unavoidable, many discussed

the importance of respecting the scheduled handover and spoke of the need for protected time, including the need to ensure that interruptions and concurrent activities, such as patient transfers, should be 'kept to a minimum'. According to some staff midwives, the way to overcome interruptions to scheduled handover was to have staff overlap, so that there was a continuing presence on the clinical department when handover was taking place. Midwives also suggested that any handover policy should include a 'do not disturb' element for scheduled handovers. The ideal handover needed an ideal location and most participants spoke about the importance of having a spacious well-ventilated closed room, 'because it is [showing] respect for people's information'.

A Director of Midwifery identified an ideal handover as one that happened at the patient's bedside and went on to suggest that the way to obviate the risk of a breach of confidentiality at bedside handovers was '[by having a] meeting first in the office and discussing the high risk patient [and] only then going to the bedside to discuss care more informally'. For some midwives, the idea of handing over patients who were not the immediate responsibility of the individual outgoing midwife was seen as not the ideal; hence the ideal handover was one conducted 'only by the midwife looking after the women'. Most clinicians described the ideal handover content as including specific abnormal episodes and several midwives spoke about the ideal handover as containing critical information, such as 'any abnormal occurrences rather than expected normal midwifery care'.

A Consultant Radiologist spoke about the timing of clinical handover and the need for flexibility, depending on the nature of the information being communicated: '[The] timing of handover was dependent on 'the scenarios presented in radiology such as: a critical report (requiring attention within one hour), an urgent report (requiring attention within 24 hours) or a clinically significant and unexpected finding which needs elective follow up, and the issuance of a standard report'. The Radiologist went on to indicate a preference for verbal voice- to-voice handover when communicating critical or urgent findings to a consultant clinician. A senior physiotherapist indicated a preference for a start of duty shift handover in advance of seeing and treating a woman. For a healthcare assistant the ideal handover was simply 'to know the person's name and [to receive] a little mini report just to know what is happening on the ward'.

Not all service users supported the practice of a bedside handover, particularly when several handovers occurred in the same day; hence the ideal handover was one in which the woman was in a position of 'not having to repeat myself all day.' When it occurred at the bedside, it should be confidential, as one woman remarked: '[an ideal handover is] information explained and discussed from one or maybe two people, like a midwife or doctor quietly so not everyone can hear'. For some of the women, an ideal handover was a one in which facts are 'simply explained, in a kind, courteous, quiet manner'.

Participants spoke about the need for supplementary tools to assist in the handover process. A Director of Midwifery suggested that an ideal handover was one that involved 'computerised handover system where relevant up-to-date details are available on each screen with a graded system to identify sick women and hotspots, [as] this would save time on paper work and walking around and handwriting'. A pharmacist described an ideal handover as one that included a 'standard handover document [so that] … all team members are aware of patients' information rather than hearing information anecdotally'. An ideal handover should include a 'signed attendance record' and 'a signed agreement that handover [was] given accurately and received clearly by staff going on and off duty'. A Clinical Midwife Manager 3 commented: '[ideally I] would like to formally build in a communication book or handing over social alert or an app [into handover] between person in charge and person in charge'. Clinical midwifery managers also spoke about a preference for a standardised format when handing over and several mentioned the ISBAR mnemonic in that connection.

Some participants also spoke about existing practices that they considered as representing the ideal handover. For example, a theatre nurse also discussed the practice of handover in relation to maternity care:

> [We have] a clear handover of clinical information in theatre from check in right through to recovery [in which] we have a booklet checklist in theatre with a lot of clear detail, all needed and we audit this every year to tweak it, [and] we are very happy with it. It includes safety pauses, pain scales and risk ratios (Staff midwife).

A Consultant Anaesthetist also described the practice of handover in the operating room and high dependence units as being 'very precise guided by clear, concise check lists and documentation to hand with laboratory findings available on screen'.

4.4 Service user experiences

Two focus groups were conducted with service users and these generated rich data on aspects of communication and handover and provided insights into the perspectives of women in maternity services. While participants did not generally recollect the routine aspects of clinical handover among staff, they spoke of particular instances in which the process of communication and handover had affected them in direct ways. For some, their involvement in handover was recalled as staff providing them with information on progress or future events, such as decisions on induction of labour or the initiation of breastfeeding. The service users' accounts carried the abiding sense that much of the communication was conducted about them, but not with them; hence the single sub-theme theme is named as 'out of the loop'.

Out of the loop

The recurring theme was the sense of being uninformed during handover reports and many participants spoke about a lack of information about themselves and being 'kept out of the loop'. One participant remarked on her involvement in handover:

> The communication between the staff members is not really to involve you as well or to inform you to a degree. Although [n. hospital] was actually very good … the only observation [I would make is] that you are not really involved in it.

Some participants spoke of their experiences of change of shift and how this impacted on their own experience. One participant remarked that the change of shift happened, including the handover report, while she was in labour: 'I was in the middle of pushing and they changed shift and they walked over to the window and they started talking'. The same participant expanded on her sense of being out of the loop at a critical time in her labour:

> And you could see that there were contractions, you could see it on the screen and I was like, "do you want me to push or do you not want me to push?" and I was shouting across to them and they were over at the window talking. I thought that was really odd at that point. I know they have to go home but do you not think they could have waited. I couldn't believe that and it was my first baby and I was really clueless and I was waiting for them to tell me everything because I had the epidural and I couldn't even feel the contractions.

Another participant recalled how she observed that while the night duty staff appeared quite concerned about her condition while in the delivery suite, as demonstrated in their constant monitoring of her, the oncoming staff appeared not to have the same sense of urgency: 'There was no mention of what concern the [night staff had] … there was nothing ever about his worry during the night about the lack of movement or anything else'. Poor communication among staff

could also impact on women's experience, such as an instance when the oncoming staff did not appear to know critical facts about the patient, as one participant explained:

> There was a handover when I got back down to the ward and they told me, the epidural didn't kick in until after I had [my baby], so when I needed my legs I didn't have them … [A] nurse came up and she said "did you have a caesarean section?" I said "no" and she said "well get out of the bed and lift your own baby." And I couldn't. So that communication obviously wasn't transferred properly because I couldn't get out of bed because my epidural was just starting.

Another participant who had complications following an epidural anaesthetic became aware of the complications having observed a note in her chart, but recalled that 'nobody ever said it to me' at the time and did not explain it subsequently. A participant who underwent an emergency Caesarean section recalled how no one had explained to her the circumstances of her emergency or the precise clinical condition that gave rise to her treatment: 'I [was] sitting in their care for long enough for someone to come up and speak to me and say, "I just want to go through what actually happened to you on that day" … no one actually came in … and told me why this happened'. This sense of being uninformed also extended to their partners, in instances when their care was escalated and their partners were not kept informed, as the same participant recounted: 'I was out of it … [for six hours and] nobody in that time spoke to [my husband]; he was just left, he was just pushed aside, he was put out into a side room … and nobody had still come to him in that six hours'.

One participant contrasted the information giving in maternity services with that of acute hospital services, observing: 'if you had a car crash or something you would be in the loop, you would be told, but I think in maternity you are talked over and around. You are not actually part of it. I don't know why that is'. Another participant remembered her experience of bedside handover: 'when people are talking about you when you are there [and] you feel like they are down playing your symptoms [because you are there]', implying that the content of handover was moderated at the bedside.

Lack of communication could be experienced in other ways, such as being left for long periods in a recovery or postnatal ward without a healthcare professional visiting, or with reference to missing medical charts or absence of records of tests undergone. Not all participants experienced lack of communication or information, as one participant observed: 'right the way up from out patients to post-op to discharge, I never found that there was any continuity issues'.
Some participants sought to rationalize their experiences of poor communication with reference to staffing levels, reasoning that staff were 'rushed off their feet'. In this way women were often 'left to their own devices'. The experience of the service being 'terribly understaffed' was a recurring theme in the women's accounts of their experiences; one participant remarked that in the absence of sufficient staff women 'appeared to be labouring on their own'. Duty shift handover also meant fewer staff on the ward while handover was taking place and participants were aware of this aspect of handover, as one participant recalled: 'they close the [office] door and there would be minimum staff going around, so if you needed anything during those times good luck to you'.

Participants experienced bedside handover in different ways. One participant experienced it as 'a little bit intimidating because there was so many of them' and another remarked that the timing of bedside handover could be inappropriate, such as at mealtimes: 'you'd be eating your breakfast and they'd be standing around watching you eating your breakfast'. Participants appeared uncomfortable with large teams at the bedside, such as grand rounds, discussing their care and history. Some participants experienced hearing very sad and difficult news at the bedside or, on one occasion, on a corridor, and indicated their preference for a small quiet room where there was privacy and family present when sensitive matters were being discussed. Participants were strongly of the view that the amount of staff and the location of handover

were important factors in the quality of their experience of communication and handover, and expressed a preference for one or two staff quietly explaining their care and events with informal discussion and frequent updates quietly at the bedside or in a small private room when sensitive matters were being communicated and discussed.

Participants spoke about the need to be included in bedside handover and several equated being included as being listened to: 'I think a lot of it is just getting them to listen to you' One woman spoke about the critical role of the mother as an information resource in the handover process:

> The key is to listen to the woman because nobody knows your own body... I know when I lost the baby; I knew something was wrong ... that something was not right here. [So] ... the medical profession [should to trust more in what we are saying because we have a good idea of what is going on.

Not all participants experienced lack of communication or information, as one participant observed: 'right the way up from out patients to post-op to discharge, I never found that there was any continuity issues'.

4.5 Summary of findings from interviews and focus groups

During the interviews and focus group discussions participant talked about their everyday experiences of conducting clinical handover. The participants talked about a range of situations in which they conducted clinical handover, their organisation's policies on handover, their own practices and the wider context in which clinical handover occurred. Their accounts described organisational policy and training, handover practices for a variety of scenarios and the tools used to support handover, as well as barriers to effective handover.

Participants indicated that there was little formal policy regarding the way that clinical handover should be conducted and little formal training specifically in relation to clinical handover. Where policy was explicit it tended to be associated with the use of IMEWS and promotion of the ISBAR handover tool; however, there was no evidence at an organisational level that the use of ISBAR or any other handover tool was compulsory. When discussing policy, many participants referred to the training in place to support local policy on handover. While most participants indicated that there was no formal training specific to clinical handover practice, those that described training referred to the routine training opportunities that arose in the course of clinical grand rounds, perinatal meetings, maternal morbidity meetings, care pathway meetings, and so forth. A small number described training in the handover tools, specifically ISBAR and IMEWS.

The data contained descriptions of the times and locations of handover, the personnel typically involved in handover scenarios and the modes of communication used. Several participants described a scheduled handover event for morning and evening shift handover and many spoke about handovers occurring during the afternoon. Some spoke of 'transfer of care' handover and handover for the purpose of escalation of care and a small number also mentioned safety pause. Handovers took place for several reasons, including team to team at change of duty shift, between duty managers at duty shift change, among medical teams for the purpose of on-call handover, during grand rounds and from department to department for escalation or transfer of care. For duty shift handover, the staff involved generally included midwives, although in some duty shift handovers non-consultant hospital doctors could be present.

The evidence indicates that midwifery and medical teams tended to have separate handovers that were particular to their own needs for transferring information and clinical responsibility. Nevertheless, there was evidence of multidisciplinary participation in medical handovers. While bedside handovers took place, the evidence was that it was not a routine part of clinical

handover. Duty shift handovers were generally reported to take place at the ward station or in an office.

Participants spoke about the content of handover reports and the tools in use to support and augment handover. The data indicated that the content was determined by the purpose of the handover, the staff grades involved and the setting in which handover occurred. Many participants indicated that clinical handover content included information relevant to the oncoming team. For example, intradepartmental handover content at change of duty shift included details on the major developments in the outgoing shift concerning each patient, while handover content among duty shift managers tended to be more in the way of an overview, but with details of selected ill patients.

The data suggest that the ISBAR mnemonic is used quite widely across both large hospitals and smaller co-located units, but that it is used in particular clinical handover situations, notably for escalation of care, theatre handover, and for telephone handover. Additionally, the IMEWS was mentioned by several participants and other tools to support and augment handover were also mentioned, including a whiteboard and IT-based systems that provided additional information to support handover.

Many participants in the focus group discussions and interviews spoke about handover practices in relation to unscheduled handover. The most common situations in which an unscheduled handover took place were reported as being when care needed to be escalated, such as a sudden deterioration or when an IMEWS score warranted escalation. Unscheduled handovers also occurred when a woman was admitted from the assessment room to the antenatal ward or the delivery suite. Unscheduled handovers were generally communicated verbally, although some indicated that they were augmented with documentary information and recorded using ISBAR. The personnel involved in unscheduled handovers were typically the staff midwife and clinical midwife manager, the senior house officer and registrar and, where warranted, the consultant.

The data provided evidence of the everyday experiences of practitioners in a range of handover situations, with many speaking about the barriers to effective clinical handover. Many participants cited interruptions in the environment in which duty shift handover took place as a major barrier to effective handover. This was particularly problematic when the telephone rang or when someone not directly involved in the handover group interrupted. The non-attendance of key personnel at the handover, due to competing commitments, and the time required to complete a handover, resulting in fatigue and inattention on the part of participants, were also mentioned as barriers. A related factor associated with perceived overlong handover reports was the large number of cases that needed to be handed over. Staff shortages, which required personnel to be available to attend to other duties, were cited by both midwives and obstetricians as a barrier to effective clinical handover. Difficulty in scheduling time to meet for handover with other healthcare professionals and poor IT infrastructure were also seen as barriers.

Participants spoke about the ideal clinical handover and drew attention to aspects of handover that needed to be considered when seeking to maximise effectiveness of the process. Many participants recognised the importance of clinical handover in the context of safe care and effective communication and, on that basis, suggested measures to ensure a more effective process. These measures included protected time, a suitable environment and supporting handover tools, including IT-based protocols. Some spoke about the importance of including the patient in clinical handover.

Service user experiences

Two focus groups were conducted with service users and these generated rich data, which provided insights on aspects of communication and handover from the perspectives of the women themselves. While participants did not generally recollect the routine aspects of clinical

handover among staff, they spoke of particular instances in which the process of communication and handover had affected them in direct ways. For some, their involvement in handover was recalled as staff providing them with information on progress or future events, such as decisions on induction of labour.

A recurring theme was the sense of being uninformed during handover reports and many participants spoke about a lack of information about themselves and being 'kept out of the loop'. Some participants spoke of their experiences of change of duty shift and how this impacted on their own experience, with some recalling being talked about, but not being included in the handover. Participants also experienced poor communication as information on their care and progress not being handed over to the oncoming team. Lack of communication could be experienced in other ways, such as being left for long periods in a recovery or postnatal ward without a healthcare professional visiting, or with reference to missing medical charts or absence of records of tests undergone.

Participants experienced bedside handover in different ways; in the main, these experiences concerned a sense of a lack of inclusion in the handover process or feeling uncomfortable or intimidated in the presence of large teams of healthcare professionals. Participants believed that the amount of staff and the location of handover were important factors in the quality of their experience of communication and handover, and expressed a preference for small teams at the bedside, clear explanations and frequent updates and having sensitive matters communicated and discussed in private.

Appendix 7: National Quality Assurance Criteria (HIQA 2011)

Planning stage
Feasibility
1. National health policy and programmes and relevant existing guidelines are specifically considered
Scope and purpose
2. The overall objective of the guideline is specifically described with the expected benefit or outcome of the guideline clearly outlined
3. The health question covered by the guideline is specifically described.
4. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described
Stakeholder involvement
5. The guideline development group includes individuals from all the relevant professional groups and intended users for example healthcare professionals, hospital managers, methodological experts etc.
6. The views and preferences of the population to whom the guideline will apply (patients, public etc) are sought and the guideline development group takes these into consideration
7. The intended users of the guideline are clearly defined
Editorial independence
8. The views of the funding body have not influenced the content of the guideline. The funding body or source of funding is clearly described or there is an explicit statement of no funding
9.Competing interests of guideline development group members are recorded and addressed with a clear description of the measures taken to minimise the influence of these interests on guideline development
Development stage
Rigour of development
10. Systematic methods have been used to search for evidence on effectiveness and cost-effectiveness to ensure that the clinical guideline is based on best available evidence. The full search strategy should be clearly outlined
11. The criteria for selecting the evidence are clearly described with reasons for including and excluding evidence clearly stated
12. The strengths and limitations of the body of evidence are clearly described with the methods or tools for assessing the quality of the evidence documented
13. The methods used for formulating the recommendations are clearly described
14. The health benefits, side effects, risks, cost-effectiveness, resource implications and health service delivery issues have been considered in formulating the recommendations
15. The recommendations have been graded for quality of evidence and strength of recommendation with an explicit link between the recommendations and supporting evidence
16. The guideline has been externally reviewed prior to its publication. There is a clear description of the selection process for experienced and knowledgeable external reviewers and how the information gathered was used by the guideline development group
17. A procedure for updating the guideline is provided and includes an explicit time interval
Clarity of Presentation
18. The recommendations are specific, clear and easily identifiable with the intent or purpose of the recommended action clearly outlined
19. The different options for management of the condition or health issue are clearly presented with a description of the population or clinical situation most appropriate to each option
20. Key recommendations are easily identifiable

Preparing for implementation stage
Applicability
21. The guideline describes facilitators and barriers to its application
22. The guideline provides advice and/or tools on how the recommendations can be put into practice
23. The potential budget impact and resource implications (equipment, staff, training etc.) of applying the recommendations have been considered
24. The guideline presents monitoring and/or auditing criteria to assess adherence to recommendations and the impact of implementing the recommendations

Appendix 8: Audit tool templates for - ISBAR, $ISBAR_3$ and adherence to guideline

Sample Audit Tool - ISBAR communication tool (deterioration in a patient's condition)

Note: The ISBAR communication tool should be documented in the patient's notes and audited as part of a documentation audit and as a step in a quality improvement process.

Date: _____/_____/_____ **Ward:**_____

Was the communication face to face, telephone etc please specify_____

Was the communication documented Yes No

Did the documentation contain the following as part of the ISBAR communication tool for patient deterioration:

Identification
Identity of individual communicating deterioration Yes No
Identity of individual(s) receiving communication Yes No
Identity of patient Yes No

Situation
Was the reason for calling identified? Yes No
Were concerns identified? Yes No
Background
Was the relevant background documented? Yes No

Assessment
Was there evidence of patient assessment? Yes No

Recommendations
Were any recommendations documented for this patient? Yes No

Patient Outcome
Stabilised
Transferred HDU/ICU
Transferred to other facility
Death

Observational studies may also be carried out to audit communication in relation to patient deterioration

Sample Audit Tool: ISBAR$_3$ Communication (handover) tool – Shift Handover

Note: The ISBAR$_3$ communication (handover) tool should be documented in the patient notes and audited as part of a documentation audit and as a step in a quality improvement process.

Was the handover face to face, telephone supported by follow up documentation etc
Please specify_____

Was the handover documented Yes No

Date: _____/_____/_____ **Ward:**_____

Did the communication (handover) include all patients in the unit Yes No

Did the documentation contain the following as part of the ISBAR$_3$ communication (handover) tool:

Identification
Identity of the lead handover person evident Yes No
Identity of individual(s), team receiving the handover Yes No
Identity of patient (s) Yes No

Situation
Location of patient (s) Yes No
Brief summary of current status Yes No
Was a problem identified? Yes No

Background
Concise summary of reason for admission Yes No
Summary of treatment to date Yes No
All baseline observations (current) Yes No
BP; Pulse; Resps; SpO2; Temp; AVPU
IMEWS (Previous IMEWS if appropriate) Yes No

Assessment
Evidence of patient assessment Yes No

Recommendation
Were recommendations made re: care of patient Yes No

Read-back
Is there evidence of read-back Yes No

Risk
Was the safety pause included in the handover Yes No
Were there any risks identified Yes No

Observational studies may also be carried out to audit communication in relation to communication (handover).

Sample Audit Tool: ISBAR$_3$ Communication (handover) tool – Inter-departmental handover

Note: The ISBAR$_3$ communication (handover) tool should be documented in the patient notes and audited as part of a documentation audit and as a step in a quality improvement process.

Was the handover face to face, telephone supported by follow up documentation etc
Please specify_____

Was the handover documented Yes No

Date: _____/_____/_____ **Ward:**_____

Did the documentation contain the following as part of the ISBAR$_3$ communication (handover) tool for the transfer:

Identification
Identity of person providing handover evident Yes No
Identity of individual(s), team receiving the handover Yes No
Identity of patient Yes No

Situation
Location of patient Yes No
Brief summary of patient's current status? Yes No
Was a problem identified? Yes No

Background
Concise summary of reason for inter-departmental handover Yes No
Summary of treatment to date Yes No
All baseline observations (current) Yes No
BP; Pulse; Resps; SpO2; Temp; AVPU
IMEWS (Previous IMEWS if appropriate) Yes No

Assessment
Evidence of patient assessment Yes No

Recommendation
Were recommendations made re: care of patient Yes No

Read-back
Is there evidence of read-back including acceptance of responsibility for patient care Yes No

Risk
Was the safety pause included in the handover Yes No
Were any risks identified Yes No

Observational studies may also be carried out to audit communication in relation to communication (handover).

Sample Audit Tool for adherence by organisations to the Communication (Clinical Handover) in Maternity Services in Ireland National Clinical Guideline No. 5

Date:_____ **Hospital:**_____ **Signed:**_____

Please answer the following questions to assess adherence to the Communication (Clinical Handover) in Maternity Services in Ireland National Clinical Guideline No. 5 in Maternity Services in your organisation.

Return to: XXXXX by _____

1. Clinical handover is recognised as a clinical risk and included in the risk register of your organisation
   Yes___ No__

2. Is participation in clinical handover prioritised over all other work except emergencies
   Yes___ No__

3. Has your organisation reviewed existing organisational clinical handover guidance (policies, procedures and guidelines) in collaboration with appropriate stakeholders, including healthcare staff, patients and their carers
   Yes___ No__

4. Has your organisation developed a local policy in compliance with the National Clinical Guideline
   Yes___ No__

5. Have the templates provided in the National Clinical Guideline been customised for use within your organisation to accommodate features of your healthcare organisation
   Yes___ No__

6. Is your quality and safety committee auditing and monitoring clinical handover practice
   Yes___ No__

7. Is there mandatory education and training of clinical handover as part of staff orientation and in-service education
   Yes___ No__

8. Are you incorporating 'Human Factors' Training in all clinical handover education and training
   Yes___ No__

9. Have all staff access to relevant, accurate and up to date sources of information during clinical handover
   Yes___ No__

10. Do you use electronic patient records
    Yes___ No__

11. Are your staff incorporating discussions around operational issues and factors that may impact on clinical care in shift clinical handover.
    Yes___ No__

12. Are all patients in the ward/unit discussed at shift handover
    Yes___ No__

13. Is clinical handover conducted in an area of minimal distractions and interruptions
    Yes___ No__

14. Is there protected time designated for inter-departmental handover
    Yes___ No__

15. Is there protected time designated for shift handover`
    Yes___ No__

16. Is your organisation's policy on communication (clinical handover) explicit and clear about the transfer and acceptance of responsibility during and following interdepartmental clinical handover.
    Yes___ No__

17. Is your organisation's policy on communication (clinical handover) explicit and clear about the transfer and acceptance of responsibility during and following shift clinical handover
    Yes___ No__

18. Is there a lead healthcare professional designated to lead shift and inter-departmental clinical handover identified in your organisation's policy
    Yes___ No__

19. Is staff attendance, roles and responsibilities at clinical handover specified in your clinical handover policy
    Yes___ No__

20. Is clinical handover conducted
    (a) Face to face
    Yes___ No__

    (b) Verbally
    Yes___ No__

    (c)Are the above supported by relevant documentation
    Yes___ No__

21. Is taped handover conducted in your organisation
    Yes___ No__

22. Are you using Read-back as part of Shift Clinical Handover
    Yes___ No__

23. Are you using the Safety Pause as part of Shift Clinical Handover
    Yes___ No__

24. Are the Faculty of Radiology QA Guidelines for the management of critical, urgent and clinically significant and unexpected radiological findings implemented in your organisation
    Yes___ No__

25. Do you use electronic systems for communicating radiological results considered to be critical, urgent, critically significant and/or unexpected findings requiring follow-up
    Yes___ No__

26. Do your medical laboratories have policies in place for clinical handover of critical results
    Yes___ No__

27. Is the National Laboratory Information system implemented in your laboratories
    Yes___ No__

28. Is the patient and/or carer involved in the clinical handover process
    Yes___ No__

29. Are you using the $ISBAR_3$ communication tool as a framework for shift handover in your organisation
    Yes___ No__

30. Are you using the $ISBAR_3$ communication tool as a framework for inter-departmental handover in your organisation
    Yes___ No__

31. Are you using the ISBAR communication tool as a framework to communicate information in relation to deterioration in a patient's condition
    Yes___ No__

32. Is there a contact person in your organisation in relation to education and training of clinical handover
    Yes___ No__

Please add any additional information or comments below

Appendix 9: ISBAR and ISBAR$_3$ communication tools - samples

ISBAR Communication Tool SAMPLE Patient Deterioration	
I **Identify**	**Identify:** You Recipient of handover information Patient
S **Situation**	**Situation:** Why are you calling? (Identify your concerns)
B **Background**	**Background:** What is the relevant background?
A **Assessment**	**Assessment:** What do you think is the problem?
R **Recommendation**	**Recommendation:** What do you want them to do?

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ISBAR$_3$ Communication (clinical handover) Tool SAMPLE Shift Handover	
I **Identify**	**Identify:** Lead handover person Individuals / Team receiving handover Patient(s)
S **Situation**	**Situation:** Location of patient(s) Brief summary of current status Is there a problem?
B **Background**	**Background:** Concise summary of reason for admission Summary of treatment to date Baseline observations (current admission) Vital Signs: BP, Pulse, Resps, S_PO_2, (F_iO_2), Temp, AVPU. IMEWS (include previous IMEWS if appropriate) NEWS (include previous NEWS if appropriate)
A **Assessment**	**Assessment:** What is your clinical assessment of the patient at present?
R$_3$ **Recommendation** **Read-Back** **Risk**	**Recommendation:** Specify your recommendations Read-Back: Recipients to confirm handover information Risk: Include the safety pause to identify possible risks

Adapted by GDG with permission from Dr S. Marshall, Monash University, Australia.

ISBAR$_3$ Communication (clinical handover) Tool SAMPLE Inter-departmental Handover	
I Identify	**Identify:** You Recipient of handover information Patient
S Situation	**Situation:** Location of patient as appropriate Brief summary of patient's current status Is there a problem?
B Background	**Background:** Concise summary of reason for interdepartmental handover Summary of treatment to date Baseline observations (current admission) Vital Signs: BP, Pulse, Resps, S_PO_2, (F_iO_2), Temp, AVPU. IMEWS (include previous IMEWS if appropriate) NEWS (include previous NEWS if appropriate)
A Assessment	**Assessment:** What is your clinical assessment of the patient at present?
R$_3$ Recommendation Read-Back Risk	**Recommendation:** Specify your recommendations Read-Back: Recipient(s) to confirm handover information and responsibility Risk: Include the safety pause to identify possible risks

Adapted by GDG with permission from Dr S. Marshall, Monash University, Australia.

Appendix 10: Safety Pause - information sheet

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Quality and Patient Safety Directorate

We are all responsible…and together
we are creating a safer healthcare system

An Roinn Sláinte
DEPARTMENT OF HEALTH

THE SAFETY PAUSE: INFORMATION SHEET

Helping teams provide safe quality care

Why	Safety awareness helps all teams to be more proactive about the challenges faced in providing safe, high quality care for patients.
Who	Team lead and available multidisciplinary team members.
When	Any time (aim for a maximum of five minutes).
How	Focus on things everyone needs to know to maintain safety. Based on one question *'what patient safety issues do we need to be aware of today'* - resulting in immediate actions. The four P's below provide examples to prompt the discussion (any prolonged discussion on specific issues can be deferred until after the safety pause).

THE SAFETY PAUSE

QUESTION:

WHAT PATIENT SAFETY ISSUES DO WE NEED TO BE AWARE OF TODAY?

Examples

- **Patients:** are there two patients with similar names; patients with challenging behaviour; wandering patients; falls risk; self harm risk; or deteriorating patients?
- **Professionals:** are there agency, locum or new staff who may not be familiar with environment/procedures?
- **Processes:** do we have: new equipment or new medicinal products (are all staff familiar with these?); missing charts; isolation procedures required; or care bundles for the prevention and control of medical device related infections?
- **Patterns:** are we aware of any recent near misses or recently identified safety issues that affected patients or staff?

Heads-up for today

- Challenges e.g. illness related leave, staffing levels, skill mix, demand surges.
- Meetings/training sessions staff need to attend e.g. mandatory training.
- New initiatives/information e.g. new protocols; feedback from external groups.
- Any other safety issues or information of interest to the team – has this been communicated to the team e.g. notice board/communication book/ patient status at a glance (PSAG) board/ other communication system etc.

Patient Feedback

- Update on actions from recent patient feedback on their experience (complaints, concerns or compliments) that we need to be aware of today?

Follow-ups	Issues raised previously (confirm included on existing risk register if appropriate), solutions introduced or being developed. For those involved in the 'productive ward' initiative this is an opportunity to review the 'safety cross' data and any improvements.
Team morale	Recent achievements, compliments from patients and what works well.

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An initiative of the Quality and Patient Safety Directorate, May 2013

For further informaton see www.hse.ie/go/clinicalgovernance

Tús Áite do Shábháilteacht Othar
Patient Safety First

Appendix 11: PeerVue (Radiology)

PeerVue is software recently purchased by the HSE and currently being installed in public hospitals and which went live in University Hospital Waterford in May 2014.

With regards to hand-over / communications, PeerVue permits Radiologists to issue "Alerts" to Clinicians with varying levels of urgency.

Three levels of urgency are defined: "Critical" – the report must be transmitted within the hour, "Urgent" – the report must be transmitted within 24 hours, and, "Clinically Significant and Unexpected" - the report must be transmitted within 1 week.

For Critical and Urgent, although an Alert is raised, the Consultant still pursues the Clinician by phone, or if necessary in person, to ensure the report is received. The Alerts function then simply records that this communication has taken place and that the report has been acknowledged.

For Clinically Significant and Unexpected, the Radiologist can issue an alert from the workstation, to be delivered via the means of the Clinician's nomination i.e. email, fax or text. This occurs automatically at a button-push on the reporting workstation. These Alerts are then followed up by clerical support staff who ensure the Alert has reached its destination and has been acknowledged.

The benefits of this system are manifold, the most important of which include aiding in the time-appropriate transmission of results and the documentation of acknowledgement of same.

Full implementation requires additional man-hours from clerical/administrative personnel within the Radiology Department to manage the alerts issued and receipt/recording of acknowledgement. These additional hours must be supported by management.

Appendix 12: MedLIS (National Medical Laboratory Information System) project

The purpose of the National MedLIS Project is to deliver a single national standardised laboratory information system, replacing the multiple disparate systems currently in use. The remit of the National MedLIS project is to procure a modern laboratory information system to support the clinical and business needs of all laboratories, and secondly to support hospital objectives in relation to laboratory services in the context of patient care for the next 7-10 years. The project is currently (September 2014) in final contract discussions with the preferred vendor.

The strategic goal for the MedLIS project is ***"To ensure patients healthcare providers have rapid 24-hour access to complete and up-to-date accurate laboratory data across all sites",*** i.e. a single national laboratory record. The deployment model for the proposed solution will be a single National system based on a central single instance of the software and database. This model will facilitate a single national laboratory record and end to end connectivity, thereby ensuring that clinicians have access to the full laboratory diagnostic data on each patient irrespective of where the patient is located and where the patient's tests were carried out.

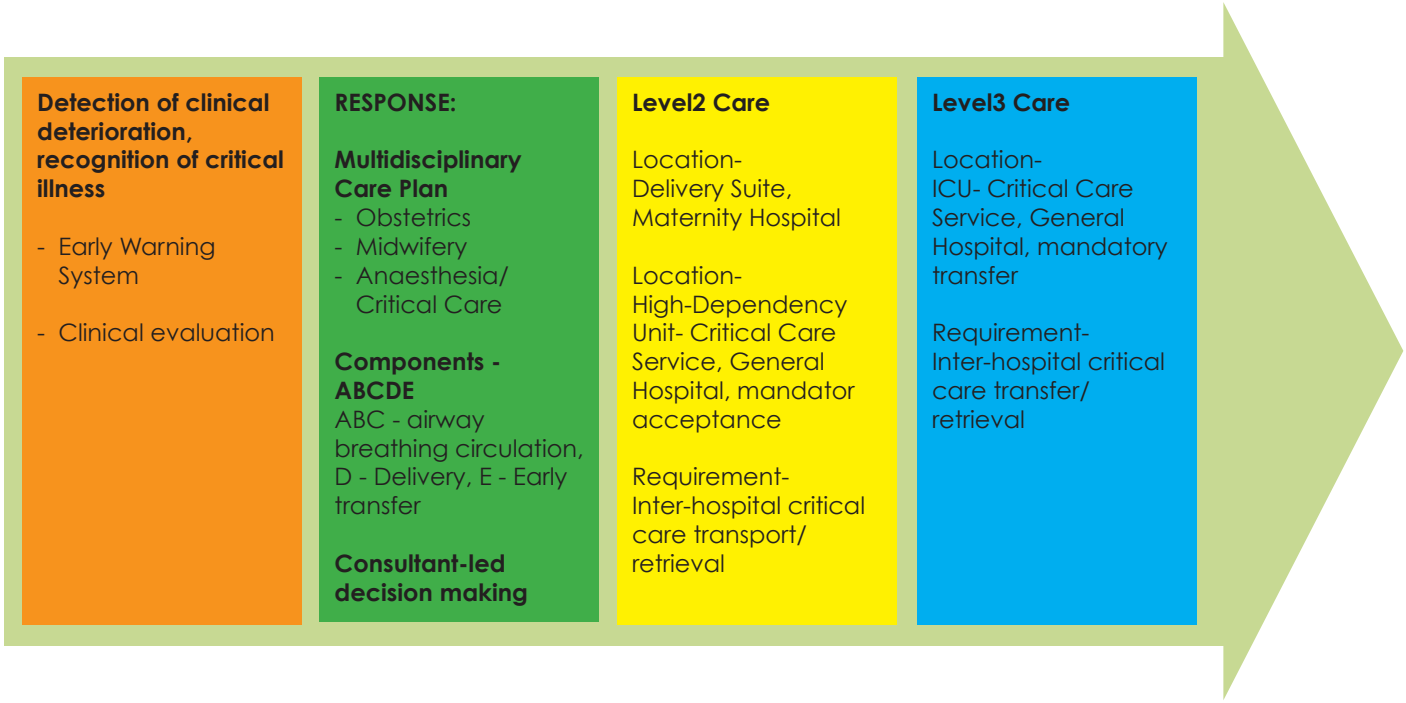
As part of the MedLIS solution, PowerChart message centre can be used to alert clinicians of abnormal results. Results are published in the Inbox of message centre as soon as they become available and an alert flag set on the patient record so that a user accessing that record can immediately see if a new result requires their attention. It is possible to flag abnormal results using user definable colours and/ or by the addition of alpha characters such as H for high, L for Low, C for critical etc. The return of critically abnormal results can also be highlighted to clinicians using the Clinicians Message centre Inbox functionality. A message showing the actual result is available to the clinician from any computer he logs into. There is also an alert in the tool bar to show that Critical or abnormal results exist and need attention. The rules engine can be set up to send an alert to a designated mobile or pager, indicating an abnormal test has been sent and the clinician needs to access the system to action it.

Abnormal results can be flagged (rules based) for telephoning. Telephone functionality and automatic population of telephone queues based on parameters which include a please phone requests, critical results, cancelled requests, exceptions and problems exist in the system. Critical results can be prioritised in these queues. The telephone functionality also gives the ability to log unsuccessful call attempts.

Security privileges exist in the system that allow restrictions to access of results and can where necessary be tailored down to individual user privileges. This can be achieved by a combination of Organisation level, role based and individual task access controls and privileges. There is a full audit trail. Whenever a record is assessed or viewed an audit of this event is captured in the system and the user name and date and time are recorded against this event.

Appendix 13: Levels of Care for the Deteriorated Critically Ill Pregnant Woman – *Joint Faculty of Intensive Care Medicine of Ireland*

Care pathway for the deteriorated critically ill pregnant woman



Acute Care	Level 0	Hospital ward clinical management
	Level 1	Higher level of observation eg. PACU
Critical Care	Level 2	Active management by critical care team to treat and support critically ill patients with primarily single organ failure
	Level 3	Active management by critical care team to treat and support critically ill patients with two or more organ failures
	Level 3 s	Level with regional / national service

Reference: *Guidelines for the Critically Ill Woman in Obstetrics (HSE, 2014)*

Appendix 14: Abbreviations

ACOG	American College of Obstetricians and Gynecologists
ACSQHC	Australian Commission for Safety and Quality in Healthcare
AE	Adverse Events
AGREE	Appraisal of guidelines research and evaluation
AHHA	Australian Healthcare and Hospitals Association
AHRQ	Agency for Healthcare Research and Quality
AIR	Australian Institute of Radiography
AMA	Australian Medical Association
AMB	Australian Medical Board
AMP	Acute Medicine Programme
AMAU	Acute Medical Assessment Unit
AND	Assistant National Director
AORN	Association of Perioperative Nurses
APP	Application – referring to computer application
ARCHI	Australian Resource Centre for Healthcare Innovations
BMA	British Medical Association
CCHMC	Cincinnati Children's Hospital Medical Center
CCU	Coronary Care Unit
CEC	Clinical Excellence Commission
CEO	Chief Executive Officer
CPICU	Cardiac Paediatric Intensive Care Unit
CPSQA	Commission on Patient Safety and Quality Assurance
DG	Director General
DoH	Department of Health
ED	Emergency Department
EHR	Electronic Health Record
EM	Emergency Medicine
EMP	Emergency Medicine Programme
EMR	Electronic Medical Record
EPR	Electronic Patient Records
EWTD	European Working Time Directive
FIGO	International Federation of Gynecology and Obstetrics
FMEA	Failure Mode Effects Analysis
GP	General Practitioner
GDG	Guideline Development Group
GMC	General Medical Council
GUH	Galway University Hospital
HDU	High Dependency Unity

HEAR	Handoff Evaluation Assessing Receivers
HEIs	Higher Education Institutions
HELiCS	Handover: Enabling Learning in Communication (for) Safety
HIQA	Health information and Quality Authority
HRE	High-Risk Events
HSCPC	Health and Social Care Professionals Council
HSE	Health Service Executive
ICU	Intensive Care Unit
IADNM	Irish Association of Directors of Nursing and Midwifery
IM	Internal Medicine
IMEWS	Irish Maternity Early Warning System
ISBAR	Communication Tool – Identify, Situation, Background, Assessment, Recommendation
$ISBAR_3$	Communication tool (Identify, Situation, Background, Assessment, $Recommendation_1$, $Read\text{-}back_2$, $Risk_3$)
ISD	Integrated Services Directorate
IT	Information Technology
JOGS	Junior Obstetrics and Gynaecology Society
LMC	Lead Maternity Carer
LOS	Length of stay
MedLIS	Medical Laboratory Information System
MET	Medical Emergency Team
MICU	Medical Intensive Care Unit
MOH	Maternal Obstetric Haemorrhage
NAMP	National Acute Medicine Programme
NCEC	National Clinical Effectiveness Committee
NCEPOD	National Confidential Enquiry into Patient Outcomes and Death
NCHD	Non-consultant Hospital Doctor
NEWS	National Early Warning Score (NEWS).
NFR	Not for Resuscitation
NHMRC	National Health and Medical Research Council
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NICU	Neonatal Intensive Care Unit
NIMIS	National Integrated Medical Imaging System
NMBI	Nursing and Midwifery Board of Ireland
NMC	Nursing and Midwifery Council
NIMT	National Incident Management Team
NPSA	National Patient Safety Agency
NSW Health	New South Wales Department of Health

OR	Operating Room
OSSIE	Organisational leadership, Simple solution development, Stakeholder engagement, Implementation, Evaluation and maintenance
PACU	Post Anaesthesia Care Unit
PICU	Paediatric Intensive Care Unit
QA	Quality Assurance
QALY	Quality Adjusted Life Years
QPS	Quality and Patient Safety
RANZCOG	Royal Australian and New Zealand College of Obstetricians and Gynecologists
RCN	Royal College of Nursing
RcoA	Royal College of Anaesthetists
RCOG	Royal College of Obstetricians and Gynaecologists
RCP	Royal College of Physicians (UK)
RCPI	Royal College of Physicians of Ireland
RCSE	Royal Colleges of Surgeons of England
RCT	Randomised Controlled Trial
RDPI	Regional Director of Performance and Integration
SA Health	Department of Health (South Australia)
SAQ	Safety Attitudes Questionnaire
SCBU	Special Care Bayb Unit
SIGN	Scottish Intercollegiate Guidelines Network
SMITH	Structured Multidisciplinary Intershift Handover
TCAB	Transforming Care at Bedside
UCD	University College Dublin
UHG	University Hospital Galway
UK	United Kingdom
USA	United States of America
VQC	Victorian Quality Council
WA Health	Department of Health (Western Australia)
WHO	World Health Organisation

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