**Table: Summary of the reports included in this scoping review of clinical guidelines for handover practices in emergency departments (EDs) (n = 19).**

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| Author | Title | Country | Aim/s of the study | Study design | Population and sample size (n) | Available clinical practice guidelines (CPG)/ transition in care guidelines/ handover- model/ tool/ mnemonic in report | Key findings |
| Bost, Crilly, Patterson, & Chaboyer (2012) | Clinical handover of patients arriving by ambulance to a hospital emergency department: A qualitative study | Australia | (1) Explore clinical handover processes between ambulance and ED personnel  (2) Identify factors that impact on the information transfer to ascertain strategies for improvement. | Focused ethnographic study | Emergency care practitioners (ECPs) (n = 79) Nurses (n = 65) Doctors (n = 19) | No CPG, transition in care, handover- tool/ model or mnemonic.  Handover guideline was suggested. | Handover guideline: AMIST-Age, Mechanism of injury/ illness, Injury or illness, Signs and Treatment. Included information on place of retrieval, condition of patient on arrival of ambulance, age, signs and symptoms, observations performed, and treatment given by paramedics, past medical history if known, medications prescribed for previous medical conditions and social history if deemed relevant by paramedics.  Transfer of responsibility should also occur. Standardizing the key principles of clinical handover can prevent the loss of vital information. These principles include nominating a leader at each handover, documentation of handover, and transferring information in a predetermined format. Two different handover processes were identified depending on the patient's acuity. Handover content differed and depended on experience and the preferred method of both the receiver and the giver of information. |
| Bost, Crilly, Wallis, Patterson & Chaboyer (2010) | Clinical handover of patients arriving by ambulance to the emergency department – A literature review | Australia | To critically review research on clinical handover between ambulance services and EDs | Literature review | ECP to ED handover (n = 8 articles) | No CPG, transition in care, handover- tool/ model or mnemonic.  Handover structure was mentioned. | A detailed handover includes patient problems, incident, and patient assessment in verbal and written form. Known structures such as DeMIST are helpful. Information should include vital signs, past medical history, current medication, and pre-hospital treatment. Should be performed in two phases (a summary and then detail later). A standardized approach to handover should be followed. Discipline specific guidelines are needed. |
| Bruce, & Suserud (2005) | The handover process and triage of ambulance-borne patients: the experiences of emergency nurses. | Sweden | To explore the experiences of emergency nurses receiving patients who were brought into hospital as emergencies accompanied by ambulance nurses through an analysis of the handover and triage process. | Qualitative descriptive approach | ED nurses (n = 6) | No CPG, transition in care, handover- tool/model/ mnemonic mentioned. | The ideal handover included information that was patient focused and clearly stated identifiable problems. Handover was a verbal report, clarifying the circumstances around what happened to the patient together with a descriptive picture of the patient's problems or needs. Information regarding the patient's overall care needs were deemed more important together information on the patient's life situation and potential problems. Commence with a brief handover to obtain an impression of the patient. Attentive listening during handover is important. Handovers comprise of verbal, written and physical handover involving ED nurses, ambulance nurses, and patients. |
| Carter, Davis, Evans & Cone (2009) | Information loss in emergency medical services handover of trauma patients | United States of America | To determine the degree to which information presented in the EMS trauma patient handover is degraded. | Observation and document audit | Observed and audited handovers (n = 96) | No CPG, transition in care, handover- tool/model/ mnemonic mentioned | Knowledge regarding what happened to the patient before arriving at the ED is important. Handover information should include: pre-hospital hypotension, Glasgow Coma Scale, age, end-tidal CO2, pulse, respiratory rate, saturation, blood loss in filed, death of occupant in same compartment, mechanism of injury, intrusion, extrication time, estimated crash speed, anatomic location of the injury, pre-existing disease, prehospital intubation. From this list only 4.9 items were transmitted at every handover, with many not relevant to all patients. |
| Dawson, King, & Grantham (2013) | Improving the hospital clinical handover between paramedics and emergency department staff in the deteriorating patient. | Australia | To establish: (i) what aspects of the clinical handover between paramedics and ED staff impact on the effective transfer of a patient in a state of physiological deterioration (ii) how these aspects might be improved in the future. | Integrative literature review | ED doctors and nurses and paramedics  (n = 17 papers) | No CPG, transition in care, handover- tool/ model.  Handover mnemonics was mentioned. | A structured handover tool is needed. Mnemonic tools include ISBAR (Introduction, Situation, Background, Assessment and Recommendation) and MIST (Mechanism of Injury/Illness, Injuries, Signs, observations and monitoring, and Treatment given). Baseline observations, such as airway, breathing, circulation and level of consciousness, and changes in patient condition are required. Written (electronic or paper) should follow verbal handover. |
| Dojmi Di Delupis, Mancini, di Nota, & Pisanelli, (2015) | Pre-hospital/ emergency department handover in Italy | Italy | To measure communication during clinical handovers from prehospital to ED providers in a realistic setting with our communication evaluation tool. | Observational study | Observed handovers (n = 240) | No CPG, transition in care, handover- model/ mnemonic mentioned.  Handover tool was mentioned. | Handover tool: ISBAR  > 90% of handovers: the pre-hospital providers and nurses did not introduce themselves  In 36% of handovers the patient was introduced by name. Other patient demographics were only reported in 10% of handovers. Reason for the emergency call was reported in 80% of handovers. In 26% of handovers changes in the patient's condition were reported. In 8.8% of handovers, allergies were reported and in 23% the medical history and home therapies were reported. Regarding patient assessment, the information was transmitted either completely, in part or not at all, in only 1% a complete and systematic manner was used to transfer information completely. Vital signs were only reported in 66% of handovers. Recommendations (R) were not usually provided. No standardized tool existed which resulted in incomplete, partial, or disordered information being transferred. |
| Dojmi Di Delupis, Pisanelli, Di Luccio, Kennedy, Tellini, Nenci, Guerrini, Pini, & Franco Gensini (2014) | Communication during handover in the pre-hospital/ hospital interface in Italy: from evaluation to implementation of multidisciplinary training through high-fidelity simulation | Italy | (1) Development of simulated handover scenarios to evaluate the communication between pre-hospital and hospital providers (2) identify critical information that should be routinely communicated during the handovers between the pre- hospital and the hospital providers;  (3) evaluate and adapt existing tools for measuring communication between medical providers for use in the pre-hospital/ED interface (4) validate the adapted tool (5) develop training for pre-hospital providers in handover communication  (6) evaluate communication pre and post-training. | Mixed methods. Multidisciplinary handover simulations and debriefings. Baseline nursing quantitative surveys to evaluate handover communication. Multidisciplinary focus group interviews.  Handover tool validation. | *Simulation activity:* Simulation scenarios (n = 12):  Pre-hospital providers and ED physicians (n = 35),  ED nurses (n = 6),  Rescuers (n = 12) and  Actors (n = 6).  *Quantitative survey*:  Triage nurses (n = 23).  *Focus group interviews:*  Emergency physicians (n = 4),  ED nurses (n = 4) Rescuers (n = 4).  *Handover tool validation:*  Handover practices (n = 12) | No CPG, transition in care, handover- tool/model/ mnemonic mentioned. | The lack of a standardized handover communication process was a concern for authors. The ISBAR tool was implemented, and training provided. Standardized communication was suggested for handovers. Both verbal and written handovers should occur. Triage nurses suggested the following critical information: patient identification, chief complaints, clinical condition, and medications. Family contact information and pre-hospital vital signs were regarded as less important information to be received. Other information regarded as important to handover included: patient name, age, baseline condition, condition during transfer, primary survey, and patient allergies. |
| Ebben, van Grunsven, Moors, Aldenhoven, de Vaan, van Hout, van Achterberg, & Vloet (2015) | A tailored e-learning program to improve handover in the chain of emergency care: A pre-test post-test study | Netherlands | To evaluate the effectiveness of a learning program to improve ECPs adherence to handover guidelines during pre-hospital notification and handover in the chain of emergency medical service, emergency medical dispatch, and the ED. | Prospective pre-test post-test design | E-learning program:  Emergency medical services (n = 73),  Emergency medical dispatch (n = 15) Pre-test handover (n = 145) Post-test handovers (n = 167) | No CPG, transition in care, handover- tool/ mnemonic.  Described the DeMIST model. | DeMIST (Demographics, Mechanism of injury or illness, Injuries (sustained or expected), Signs (including observations and monitoring), Treatment given). The pre-test post-test indicated no significant difference in adherence to the model. Post intervention handover receiving team composition changed. Handovers took place after patient transfer. Results indicate that the DeMIST model was not always deemed appropriate for handovers. |
| Goldberg, Porat, Strother, Lim, Wijeratne, Sanchez & Munjal (2017) | Quantitative analysis of the content of EMS handoff of critically ill and injured patients to the emergency department | United States of America | A quantitative analysis of the information transferred from EMS providers to ED physicians during handoff of critically ill and injured patients. | Observational study | Observed handovers (n = 90) | No CPG, transition in care, handover- tool/model/ mnemonic mentioned | Less than half of the required information is transferred during handovers. The most transferred information includes the presenting problem, initial patient condition information, vital signs, past medical history, medications, chief concern, and overall assessment of pre-hospital providers. A summary of the patient situation and clinical impression is also deemed important, but only done 31% of the time. Standardization is used increasingly and improves patient handoff quality and could potentially improve patient outcomes. |
| Iedema, Ball, Daly, Young, Green, Middleton, Foster-Curry, Jones, Hoy, Comerford (2012) | Design and trial of a new ambulance-to-emergency department handover protocol: IMIST-AMBO | Australia | (1) Identify the existing structure of paramedic-to-emergency staff handovers by video analysis.  (2) involve practitioners in reflecting on practice using footage (3) combine those reflections with formal analyses of these filmed handovers to design a handover protocol (4) trial-run the protocol  (5) assess the protocol’s enactment | Video-reflexive ethnography with six phases: Focus groups and pre- and post-survey analysis | Pre-videoed handovers (n = 73) post-videoed handovers (n =63) pre-post survey triage nurses (n = 416) | No CPG, transition in care, handover- tool/model/ mnemonic mentioned. Handover protocol was mentioned. | A paramedic to ED staff protocol was developed from existing practices. Handover protocol: IMIST-AMBO Current practices indicated that 73 handovers were done in a tentative or tacit structure by paramedics. Information included was patient identification, an outline of the medical complaint, the mechanisms of injury, details about the complaint or the relevant injuries and vital signs and GCS. Post implementation IMIST-AMBO appeared to provide paramedics with cues for components they regard as critical, while also matching informational expectations of ED clinicians. Mnemonic ensured more consistent information transfer, improved triage and care decisions. |
| Jenkin, Abelson-Mitchell, Cooper (2007) | Patient handover: Time for a change? | United Kingdom | To identify the current process of information transfer between ambulance staff and ED staff during patient handover. | Quantitative questionnaire | ECPs (n = 42), Doctors (n = 17) ED nurses (n= 21) | No CPG, transition in care, handover-tool/ model, or mnemonic. | The reason for attendance, problems requiring immediate intervention and treatment provided, and any significant previous medical history is important. Electronic transfer of information to the ED may improve the delivery and efficiency of handovers. Legible written information with a verbal handover should occur. Patient's name, time of the event, time of medication administration, suspected injuries/ illness, and allergies are part of the handover. |
| Jensen, Lippert, & Østergaard (2013) | Handover of patients: a topical review of ambulance crew to emergency department handover | Europe | To identify important factors influencing ambulance to ED handover, and to suggest ways to optimize this process. | Literature review | Ambulance and ED personnel handovers (n = 18 papers) | No CPG, transition in care, handover- model/ mnemonic.  Handover tool mentioned. | Verbal and written handover information should be transferred in a structured manner. Responsibility should also be transferred. Some studies indicated a need for national guidelines. Handovers should be a context specific. Three structured tools were identified: 1) BAUM ‘Bestand’ (inventory), ‘Anamnese’ (medical history), ‘klinische Untersuc- hungsergebnisse’ (clinical findings) and ‘Massnah- men’ (actions). 2) MIST and 3) IMIST-AMBO. (identification, mechanism/medical impact, signs, vitals and Glasgow Coma Scale, treatment and trends/ response to treatment – allergies, medications, back- ground history and other (social) information). |
| Meisel, Shea, Peacock, Dickinson, Paciotti, Bhatia, Buharin & Cannuscio (2015) | Optimizing the patient handoff between EMS and the ED | United States of America | To identify issues surrounding the EMS handoff process to describe how the EMS-to-ED handoff functions and how it can be improved. | Qualitative,  focus groups | EMS providers (n = 48)  Focus groups (n = 7) | No CPG, transition in care, handover- tool/model/ mnemonic mentioned | Handovers should be clear, effective, and delivered to the right ED staff. Changes in patient condition should be described in detail. Participants suggested a direct handover to the physician from EMS. Some but not all aspects of the handover should be standardized. Electronic records should be used for the written component of the handover. |
| Picinich, Madden, & Brendle (2019) | Activation to arrival: transition and handoff from emergency medical services to EDs | United States of America | Not provided | Not provided | Not provided | No CPG, transition in care, handover- tool/ model or mnemonic. | An effective standardized handoff is needed. Handover information should include airway status and management, vital signs, neurologic exam, therapeutic interventions, mechanism of injury, time of symptom onset, medical history. Identification, chief complaint, status, assessment, interventions, and background and response to treatment. Should include a verbal and written component. |
| Reay, Norris, Nowell, Hayden, Yokom, Lang, Lazarenko, Abraham (2020) | Transition in care from emergency services (EMS) providers to emergency department (ED) nurses: A systematic review | Canada | To examine: (1) factors that influence transitions in care from EMS providers to ED nurses (2) the effectiveness of interventional strategies to improve these transitions. | Mixed methods systematic review | Emergency care practitioners (ECPs), medical providers and ED nurses  (n = 20 articles) | No CPG or handover- model/tool/mnemonic in report.  Transition in care guideline was suggested. | Transition in care guidelines include:  DeMIST (Demographics, Mechanism of injury or illness, Injuries (sustained or expected), Signs (including observations and monitoring), Treatment given) or IMIST-AMBO (Identification, Mechanism/ Medical complaint, Injuries/ Information related to the complaint, Signs, Treatment and Trends - Allergies, Medication, Background history, other information. Guideline should involve the patient and family. Pre-notification and a dedicated person to be allocated to the handover and performing triage. Use of digital images is useful to ED nurses. Using a standardized protocol resulted in conflicting findings. Standardized handoffs can improve patient safety and ensure the transfer of essential information transfer, but flexibility might be needed. |
| Thakore & Morrison (2001) | A survey of the perceived quality of patient handover by ambulance staff in the resuscitation room | Scotland | To describe current perceptions of medical and ambulance stay. | Descriptive survey with questionnaires | Medical staff (n = 30)  Ambulance staff (n = 67) | No CPG, transition in care, handover- tool/model/ mnemonic mentioned | A system including patient details, followed by a concise history of the events, general medical condition, salient physical, and vital signs should be developed. Medical staff (69%) felt the quality of handovers varied a great deal between ambulance crews. Information received included: history, vital signs. Handover training is needed. |
| Wood, Crouch, Rowland, & Pope (2015) | Clinical handovers between prehospital and hospital staff: literature review | United Kingdom | Intended to inform the policy debate and future research about the quality and effectiveness of pre-hospital to hospital handover | Literature review | Verbal and written handovers in EDs (n = 21 papers) | No CPG, transition in care, handover- tool/ model.  Handover mnemonics were mentioned. | Common mnemonics used in the pre-hospital settings for handovers are MIST and ICE/ASHICE (injury, condition, time to hospital, with Age, Sex and History). Unstructured handovers caused miscommunication. Verbal handovers are preferred with written documentation. Mnemonics improved handover consistency. Many factors influence handovers making standardization difficult. The utility of mnemonics is still inconclusive. |
| Yegane, Shahrami, Hatamabadi, Hosseini-Zijoud, (2017) | Clinical information transfer between EMS staff and emergency medicine assistants during handover of trauma patients | Iran | Audit current clinical handover using the Identify, Situation, Background, Assessment, and Recommendation (ISBAR) tool. Survey the effect of training the ISBAR tool to staff. | Clinical audit study | Doctors and ECPs  (n = 150 handovers) | No CPG, transition in care, handover model or mnemonic. Handover tool was mentioned. | Handover tool: ISBAR  The delivery of patients and information to the ED is essential and should be done in a comprehensive and safe manner. Adapting to and using a standard tool can improve patient handover quality and reduce the number of errors. Marked increase in adherence to the tool observed after training. A standardized tool was available but not everyone was aware of it. Using a standardized tool can improve patient handover quality. |
| Yong, Dent, & Weiland (2008) | Handover from paramedics: Observations and emergency department clinician perceptions | Australia | To describe the types of information provided in handovers. To assess perceptions of handovers and handover information. To assess the consequences of poor handover and possible improvements to handovers. | Mixed methods  Quantitative questionnaire-based survey  Handover observation  Post survey questionnaire | *Questionnaire:*  n = 54 (n = 16 doctors, n = 24 nurses and n = 11 undisclosed).  *Handover observation:*  n = 311 handovers.  *Post survey:* Nurses (n = 171) and doctors (n = 21) | No CPG, transition in care, handover- tool/model/ mnemonic mentioned | Handovers should be verbal and written. Doctors are not commonly present during handovers of low acuity patients. Handover should be provided to ED nurse and doctor. Patient handovers included information on the presenting problem, vital signs, past medical history, mental and pre-hospital treatment, physical examination, social history, and medications. |