

BMJ Open Clinical practice guidelines for person-centred handover practices in emergency departments: a scoping review

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ABSTRACT

Objective To review the available information on clinical practice guidelines for person-centred and current handover practices between emergency care practitioners (ECPs) and healthcare professionals in emergency departments (EDs). Collating existing clinical practice guidelines may improve handover practices.

Eligibility criteria Clinical practice guidelines for person-centred handover practices between ECPs and healthcare professionals in EDs. ECPs transporting and handing patients over to healthcare professionals in EDs. Healthcare professionals including doctors and nurses working in EDs, who are involved in handovers with ECPs. Studies conducted in EDs, emergency rooms or emergency centres in any geographical area. No language or time restrictions were applied. The search included published and unpublished studies, opinion papers as well as primary sources, and evidence synthesis. All qualitative and quantitative research designs were included.

Sources of evidence The literature on clinical practice guidelines for person-centred handover practices was reviewed. Three electronic databases were searched: MEDLINE (PubMed), CINAHL (EBSCO) and Scopus from inception to May 2023 with no time limits set for the inclusion of published literature in the review. Six guideline organisations were also searched.

Charting methods A data extraction tool was developed, pilot-tested and used to extract data from the included studies.

Results 19 studies met the inclusion criteria. Various mnemonics exist for handover practices. Where mnemonics are not used, participants have identified important information that should be included during handover practices. We did not find any clinical practice guidelines or information on person-centred handover practices in any of the reviewed articles.

Conclusions Currently, there is no gold standard for person-centred handover practices, which has led to various practices being implemented. Currently, there is a paucity of literature on person-centred handover practices. Most articles expressed a need for standardised handover practices; however, not all aspects of handover practices can be standardised and should be kept patient and context-specific.

Trial and protocol registration This scoping review protocol was registered on Figshare (10.6084/m9/m9.figshare.21731528).

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The possibility of missing relevant records during the review process.
- ⇒ The exclusion of non-English publications could have led to missing information.
- ⇒ Records were screened by two reviewers, and a third reviewer was used to clear any discrepancies.

INTRODUCTION

In clinical settings, transfer of care is often described as handover, hand-off or transition of care. The British Medical Association (2008) defines 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’.¹ Handover occurs multiple times daily in all healthcare facilities and among various healthcare professionals.^{2–4} Regarded as a complex procedure, handover involves many different role players (professionals, patients, members of the public) and uses a variety of technologies and formats.⁵

In emergency departments (EDs), handovers differ from those in other healthcare settings due to the ED’s unique, somewhat chaotic and complex environment.^{3–5} Rapid decision-making, rather than listening, is often prioritised in EDs.^{3 4 6} Among the different types of handovers that occur in EDs, handovers from the prehospital environment (emergency care practitioners (ECPs)) to the in-hospital environment (healthcare professionals—doctors and nurses) are vitally important for continuity of care, patient safety and quality care.^{4 6 7} Effective communication is crucial during handovers between ECPs and healthcare professionals in EDs. Currently, various handover tools/mnemonics/protocols/models aim to facilitate communication and standardise handover practices between ECPs and healthcare professionals,^{4–6} but the

optimal method has not been identified. Consequently, many studies have suggested the need for improving handover practices.⁴⁻⁸

Standardised handover practices have been associated with improved staff satisfaction, comprehensive information transfer, shortened handovers,⁵ retention of information,⁸ fewer interruptions, increased confidence in handover delivery⁷ and less room for mistakes.⁹ Ideally, standardised methods should be closely followed to prevent information loss.⁵ Health professionals are not the only role players during handovers; patients are also involved. Patients are commonly involved in handovers during nursing staff shift changes.^{10,11} Patient involvement during handovers is important for delivering person-centred care and shared decision-making, which reduces anxiety, improves satisfaction and increases participation in care.¹¹⁻¹³ Patients who are involved in their care also could clarify and correct inaccuracies.¹¹ Despite these benefits, patients are rarely included in handovers.¹² Current commonly used handover tools do not include the patient as a contributor to the process. The patient is the only constant factor during handover and is therefore a valuable addition in ensuring continuity of care,¹⁴ and a deliberate effort needs to be made to include patients in the handover process. Person-centred handovers promote person-centred care, which involves eliciting information regarding patients' values and preferences to guide individualised care.^{10,13} Person-centred care in EDs has gained traction with the move from being centred on the illness or provider to being individualised and based on partnerships between patients and healthcare professionals.¹³ Despite person-centred care gaining momentum in EDs, research on person-centred handover practices between ECPs and healthcare professionals in EDs is limited.

Aim

This review initially aimed to identify and present the available information on clinical practice guidelines for person-centred handover practices between ECPs and healthcare professionals in EDs. However, due to no clinical practice guidelines for person-centred handover practices found at the time of the search, the authors broadened the inclusion criteria and included all literature available found on current handover practices between ECPs and healthcare professionals in the ED.

METHODS

The review was conducted according to the Johanna Briggs Institute (JBI) methodology for scoping reviews.¹⁵ The results were reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews checklist.¹⁶

Data sources and search strategy

As per the JBI approach, literature was searched in three steps. The search strategy was designed and refined in collaboration with an information specialist. Step 1: an

initial search using MEDLINE (PubMed) was conducted. For the full electronic search strategy conducted on MEDLINE (PubMed) (see online supplemental table 1).

Step 2 involved searching the CINAHL (EBSCO) and Scopus databases. Although we planned to search Web of Science, we did not search Web of Science because most studies were duplicate studies found on both CINAHL (EBSCO) and Scopus. Step 3 involved searching for organisations that publish clinical practice guidelines, namely the National Institute of Health, the American College of Physicians, the National Institute of Health and Care Excellence, the Registered Nurses Association of Ontario, the Australian Medical Association and the British Medical Association. Lastly, the reference lists of included studies were searched for additional studies. To take advantage of relevant available literature on the topic, the search was not limited to a specific time frame. Searches were conducted between 29 January and 31 May 2023 for literature published from inception to May 2023 after the search strategy was pilot-tested by the information specialist and one member of the scoping review team (SdL). The last search for literature on the topic was searched for on 31 May 2023.

Inclusion and exclusion criteria

The participants, concept and context framework were used to determine the inclusion criteria for the review.¹⁵

Participants

ECPs transporting and handing patients over to healthcare professionals in EDs. Healthcare professionals including doctors and nurses working in EDs and involved in handovers with ECPs.

Concept

Clinical practice guidelines for person-centred handover practices and current handover practices between ECPs and healthcare professionals in EDs.

Context

Studies were conducted in EDs, emergency rooms or emergency centres in any geographical area.

Due to limited literature, we did not apply any language or time restrictions. The search included published and unpublished studies, opinion papers as well as primary sources, and evidence synthesis. All qualitative and quantitative research designs were included.

Search outcomes

The initial search yielded 129 records and 3 handover guidelines from organisation sites, resulting in 132 records. No automation tools were used for the screening and selection process. After de-duplication, irretrievable and non-English records were removed, and 69 records were screened. The abstracts of 69 records were screened. 48 records did not meet the inclusion criteria and were excluded, resulting in 21 full-text reports being screened. Thereafter, 13 reports were excluded as they did not pertain to inclusion participants (population),

some were the wrong participant group, and articles were not related to handover practices. From there, 11 reports were identified from reference lists of identified articles resulting in 19 studies being included in the final review (see online supplemental figure 1). All reports were uploaded into Mendeley reference management software 2022 (Mendeley Ltd, Elsevier, New York). All full-text citations were uploaded in Rayyan (2022) to collaboratively review the literature. The full-text citations were assessed in detail against the inclusion criteria by two members of the scoping review team independently (SdL and TH), and a third reviewer (CF) resolved any disagreements.

Data extraction and synthesis

A data extraction tool was developed, pilot-tested and used to extract data from the included studies (see online supplemental table 2).

Patient and public involvement statement

No patient or public contribution.

RESULTS

Most of the reports originated from developed countries, of which 37% (n=7) were done in Europe, 32% in Australia (n=6), 26% in America (n=5) and 0.05% in the Middle East (n=1).

Articles were published between 2001 and 2020. Most of the articles (47%) were published between 2011 and 2015 (n=9), followed by 2016–2020 (n=4), then 2006–2010 (n=3), with the least reports published between 2001 and 2005 (n=2) at 10%. Evidently, the number of publications on handover practices between ECPs and healthcare providers in EDs has increased over the last 20 years (see online supplemental figure 2).

42% of reports were qualitative (n=8), which included observational studies, focus group interviews, audits and ethnographic studies. 15% of articles were quantitative (n=3), 15% were mixed methods studies (n=3), and 26% were reviews (systematic and literature) (n=5). All studies were conducted in EDs involving various participants; 5% included ED nurses only, 5% included only ECPs, 5% included ECPs and ED nurses, 10% included ECPs and doctors, 52% included ED nurses, ECPs and doctors, and 15% of articles were document audits (see online supplemental table 3).

Four studies used standardised or structured handover tools. Two studies referred to guidelines, and two studies referred to mnemonics. The remaining 13 articles did not provide a specific term for handover practices. 10 studies provided a specific tool or mnemonic to be used when conducting a handover such as MIST,^{17–19} DE-MIST,^{20 21} ISBAR,^{18 22–24} IMIST-AMBO,^{19 25 26} ICE/ ASHICE¹⁷ and BAUM.¹⁹ The remaining nine studies mentioned important details or information that should be included in handover practices (See online supplemental table 4).

DISCUSSION

This scoping review aimed to identify and present available information on clinical practice guidelines

for person-centred handover practices between ECPs and healthcare professionals in EDs. This information may be used to develop clinical practice guidelines for person-centred handover practices in EDs. Currently, person-centred handover practices in the ED lack standardisation, and there is no universally accepted framework for what they should encompass. Standardised patient and context-specific person-centred handover practices have the potential to improve patient care and safety in ED settings.

We reviewed 19 articles that described various handover practices across the world. None of the articles described clinical practice guidelines for person-centred handover practices in EDs, although most studies confirmed that effective handover is essential for the continuity of patient care and safety.²⁷ Handovers should describe what happened to the patient before arriving in the ED.²⁸ Handovers should also be comprehensive, relevant, timely and safe.²² Handovers depend on clear, concise, confident and respectful communication.^{27 29}

In the reviewed articles, no information could be found on person-centred handover practices in the ED specifically the handover practices between ECPs and healthcare professionals in the ED. Person-centred handover has been introduced in nursing shift change handovers in general wards with handovers being conducted at the bedside to include patients.^{10 11} The inclusion of patients during the handover while performing handover at a patient's bedside is something to consider in clinical practice guidelines for person-centred handover practices. The inclusion of patients in their care and decision-making is seen as a form of person-centred care.¹²

Various mnemonics have been suggested to guide the content and flow of handovers. These mnemonics include MIST (mechanism, injury, signs, treatment),^{17–19} IMIST-AMBO (identification, mechanism/medical impact, signs, vitals and Glasgow Coma Scale, treatment and trends/response to treatment—allergies, medications, background history and other (social) information)^{19 25 26} and DeMIST (demographics, mechanism of injury/ illness, injuries sustained/ suspected, signs as recorded (observations), treatment administered).^{21 30} A study by Bost et al³¹ reported the use of the mnemonic AMIST (age, mechanism, injury, signs, treatment) in resuscitation room handovers. The mnemonic ISBAR (identify, situation, background, assessment and recommendation) has also been mentioned by Dawson and King,¹⁸ Fahim Yegane et al²² and Dojmi Di Delupis et al^{23 24}, along with the BAUM mnemonic ('Bestand' (inventory), 'Anamnese' (medical history), 'klinische Untersuchungsergebnisse' (clinical findings) and 'Massnahmen' (actions)).¹⁹ In addition to these mnemonics, specific information deemed vital for handovers includes the patient's name, patient's date of birth, clinical situation compared with the current situation, reason for an emergency call, patient's history, home therapies and a brief overview of the treatment given.^{18 20 22 26 31–34} Information on the place of retrieval, signs and symptoms, observations, treatment provided

prehospital, social history if applicable³¹ and problems requiring immediate attention³² are also crucial. Recently, Picinich et al²⁷ emphasised including information on airway status and management, vital signs, mechanism of injury, time of symptom onset, assessment, background and response to treatment in handovers. Dawson et al¹⁸ described handovers according to the ABCs (baseline information on the airway, breathing, circulation and level of consciousness), while Dojmi Di Delupis et al²³ added family contact information to their list. Much variation exists on what information should be included in handovers, which could explain differences in handover practices. Much of the additional information mentioned can be placed under the different headings of the various mnemonics. Finding the gold standard between the mnemonics and important information may improve handover practices.

Standardising handover practices may have several benefits including improved communication and information transfer.^{19 25 29} A greater volume of information can be transferred in a short period,^{17 19 26} which reduces handover duration, repetition and uncertainties.^{19 26} Standardised handovers have also been shown to reduce negative communication events.¹⁹ Additionally, standardised handover practices improve patient safety^{25 27} and continuity of care²⁷ and may improve patient outcomes.²⁹

One study suggested the development of national guidelines to direct handover practices involving a structured format.¹⁹ Almost all studies emphasised the need for both verbal and written components during handovers.^{17 19 23 27 32 33 35} Verbal information handover clarifies the circumstances around what happened,³⁵ while written information may include paper or electronic records^{18 27 32 36} that support the verbal information and serve as a record of prehospital care.¹⁸ This information should be physically transferred.³⁵

This review highlights that while standardisation and guidelines are essential for directing handover practices, they should also be context- and patient-specific.^{19–21 25 36} Factors such as noise, chaos, lack of adequate space, staff shortages, workload and interruptions may hamper the standardisation of handover practices.¹⁷

In addition to information transfer, handovers also involve the transfer of responsibility.³¹ We could not identify many articles that explicitly described the transfer of responsibility during handovers. Bost et al³¹ suggested that while the patient is still on the ambulance stretcher, the patient remains the responsibility of the ambulance personnel. Bruce and Suserud³⁵ suggested that symbolic handover occurs when the patient is transferred from the ambulance stretcher to the hospital stretcher or the words ‘the patient is now yours’ are mentioned. Guidelines for handovers should explicitly include guidance on the transfer of responsibility. Since, handover practices involve the transfer of responsibility and care from one healthcare provider to the next, handover practices should also include ED physicians, ED nurses, ECPs and patients.^{33 35 36}

Additionally, Reay et al²⁵ and Bost et al³¹ suggested that a dedicated healthcare professional (handover leader) should be allocated to each handover. Including the patient’s significant other may also add valuable information.³⁵

CONCLUSION

This scoping review highlights the paucity of clinical practice guidelines for person-centred handover practices. Handover practices are critical for patient safety and favourable patient outcomes. Patient handovers should be conducted in a comprehensive, accurate, person-centred manner. Various mnemonics are available (used or unused) for handover practices, but a universal guideline is lacking. Future research should focus on guiding handover practices towards patient and context-specific person-centred practices, potentially improving continuity of care and person-centred care in the ED.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval Ethics approval for the study was obtained from the Faculty of Health Sciences Research Ethics Committee at the University of Pretoria (205/2022)

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information. Dataset available from the UP-research data (Figshare) repository, DOI: 10.25403/UPresearchdata.24679407.

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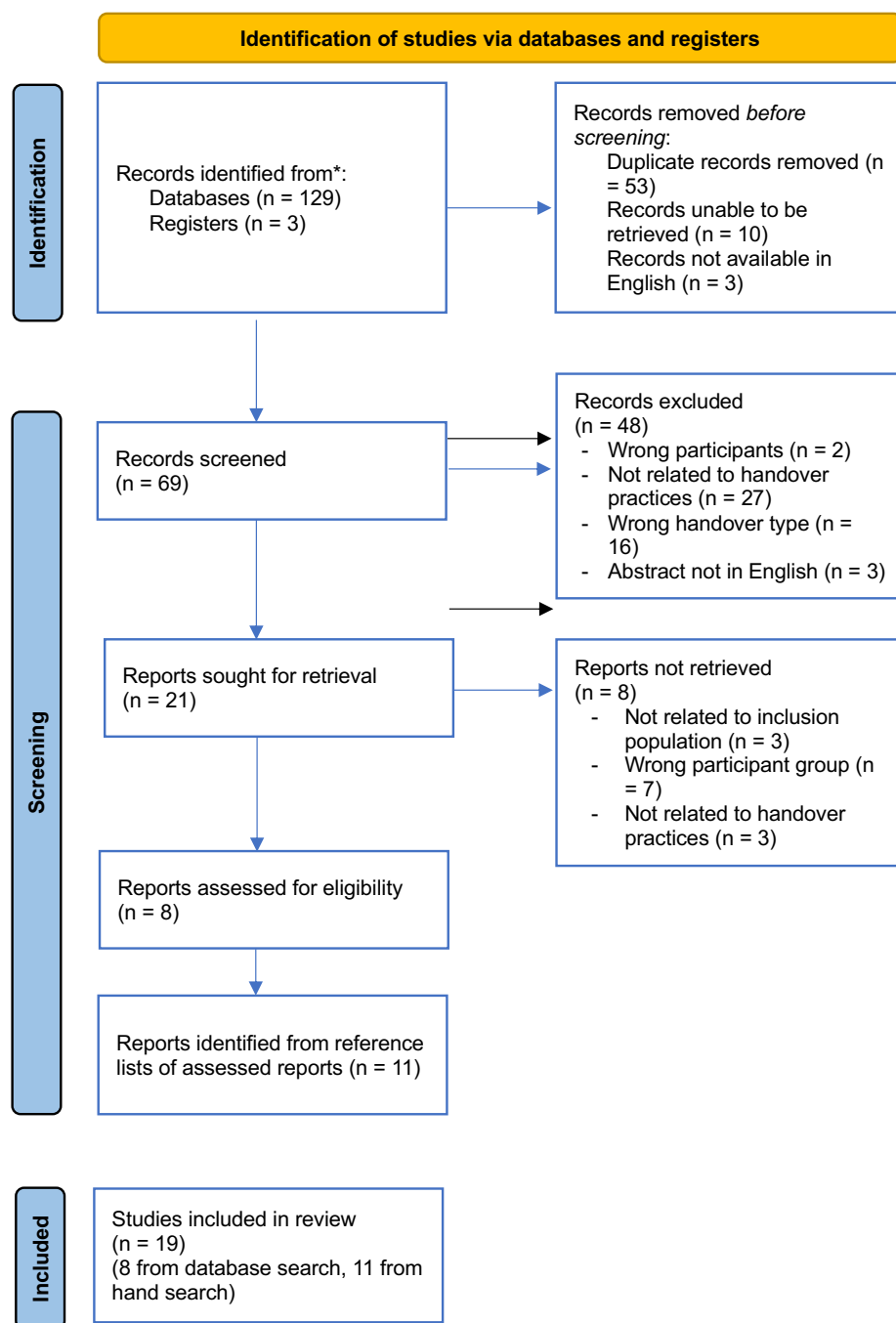
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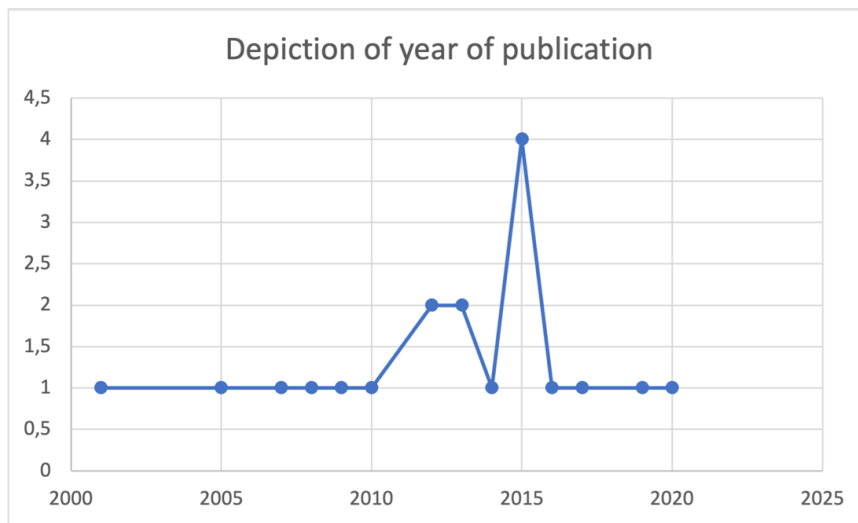
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Supplementary figure 1: PRISMA flow diagram-search and retrieval process



Supplementary figure 2: Illustration of year of publication

Supplementary table 1: Search strategy in MEDLINE (PubMed)

	Search	Number of results retrieved
#1	guideline – MeSH	172,596
#2	patient-centered care – MeSH	23,587
#3	patient handoff – MeSH	1,532
#4	hospital emergency service – MeSH	95,992
#5	"guideline" [title/abstract] OR "guideline" [text word] OR "clinical practice guideline" [title/abstract] OR "clinical practice guideline" [text word] OR "practice guidelines" [title/abstract] OR "practice guidelines" [text word]	249,360
#6	"patient-centered care" [title/abstract] OR "patient-centered care" [text word] OR "patients" [title/abstract] OR "patients" [text word] OR "Person-centered care" [title/abstract] OR "Person-centered care" [text word]	760,568
#7	"patient handoff" [title/abstract] OR "patient handoff" [text word] OR "handover" [title/abstract] OR "handover" [text word] OR "clinical handover" [title/abstract] OR "clinical handover" [text word] OR "emergency handover" [title/abstract] OR "emergency handover" [text word] OR "handoff" [title/abstract] OR "handoff" [text word] OR "care transfer" [title/abstract] OR "care transfer" [text word] OR "shift report" [title/abstract] OR "shift report" [text word]	3,898
#8	"hospital emergency service" [title/abstract] OR "hospital emergency service" [text word] OR "emergency medical services" [title/abstract] OR "emergency medical services" [text word] OR "emergency department" [title/abstract] OR "emergency department" [text word] OR "accident and emergency" [title/abstract] OR "accident and emergency"[text word]	155,816
#9	("guideline" [MeSH Terms] OR ("practice guidelines" [text word] OR "guideline" [text word] OR "clinical practice guidelines" [text word])) AND ((patient-centered care [MeSH terms]) OR ("patient-centered care" [text word] OR "patients" [text word] OR "person-centred care" [text word])) AND (("patient handoff" [MeSH Terms]) OR ("patient handoff" [text word] OR handover [text word] OR "clinical handover" [text word] OR "emergency handover" [text word] OR handoff [text word] OR "care transfer" [text word] OR "shift report" [text word])) AND ((hospital emergency service [MeSH Terms]) OR ("hospital emergency service" [text word] OR "emergency medical services"	30

	[text word] OR "emergency department" [text word] OR "accident and emergency" [text word])	
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Supplementary table 2: Data extraction tool

Author	Year	Country	Aim/s of the study	Study Design	Setting	Population and sample size	Available clinical practice guidelines	Content of clinical practice guidelines	Key findings	Gaps in the research

Supplementary table 3: Characteristics of included studies

Year		<i>N</i>	%
	2001 – 2005	2	10
	2006 – 2010	3	15
	2011 – 2015	9	47
	2016 – 2020	4	21
Country	Europe	7	36
	Australia	6	31
	America	5	26
	Middle East	1	05
Design	Qualitative	8	42
	Quantitative	3	15
	Mixed Methods	3	15
	Systematic reviews	1	05
	Literature review	4	21
Sample	ED nurses only	1	05

Supplementary table 4: Summary of the reports included in this scoping review of clinical guidelines for handover practices in emergency departments (EDs) (n = 19).

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.	<i>Simulation activity:</i> Simulation scenarios (n = 12): Pre-hospital providers and ED physicians (n = 35), ED nurses (n = 6), Rescuers (n = 12) and Actors (n = 6). <i>Quantitative survey:</i> Triage nurses (n = 23). <i>Focus group interviews:</i> Emergency physicians (n = 4),	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.

					ED nurses (n = 4) Rescuers (n = 4). <i>Handover tool validation:</i> Handover practices (n = 12)		
Ebben, van Grunsvan, 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-videod handovers (n = 73) post-videod 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	Europe	To identify important factors influencing ambulance to ED handover, and to	Literature review	Ambulance and ED personnel handovers (n = 18 papers)	No CPG, transition in care, handover- model/ mnemonic.	Verbal and written handover information should be transferred in a structured manner. Responsibility should also be transferred. Some

	emergency department handover		suggest ways to optimize this process.			Handover tool mentioned.	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 Untersuchungsergebnisse' (clinical findings) and 'Massnahmen' (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 staff.	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-	Literature review	Verbal and written handovers in	No CPG, transition in care, handover- tool/ model.	Common mnemonics used in the pre-hospital settings for handovers are MIST and ICE/ASHICE (injury, condition, time to hospital, with Age,

			hospital to hospital handover		EDs (n = 21 papers)	Handover mnemonics were mentioned.	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	<i>Questionnaire:</i> n = 54 (n = 16 doctors, n = 24 nurses and n = 11 undisclosed). <i>Handover observation:</i> n = 311 handovers. <i>Post survey:</i> 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.

