

## REVIEW

## EFFECTIVE COMMUNICATION AND SHARING INFORMATION AT CLINICAL HANDOVERS

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## Abstract

**Aim:** The aim of this study was to present an overview of current knowledge of approaches to improving patient safety and to ensuring continuity of care at clinical information handovers (handoffs). **Design:** Descriptive summarizing study. **Methods:** PubMed, Science Direct, Embase and Google Scholar databases were studied, focusing on papers published in English over the past five years. The overview included papers dealing with the effectiveness of patient information transfer between members of staff, teams, and healthcare providers. After classification of materials, 28 articles were finally analyzed. **Results:** The tools for information handovers were mostly (i.e., in 18 instances) based on the mnemonic SBAR list. To a lesser extent, IPASS technology, the structure of body systems, and a checklist for trauma patients were used. The quality of transferred information was most frequently assessed at ICUs. **Conclusion:** The implementation of structured approaches for both oral and written information on patients is problematic, but the authors agree that it is necessary to take into account the particular conditions and context of communication.

**Keywords:** care continuity, information handover/handoff, patient safety, standardization.

## Introduction

In increasingly sophisticated healthcare systems, use of modern technologies can increase the risks associated with patient information handovers, as this influences the means of communication, degree of mutual understanding and ambiguity of reports. It may be difficult to ensure the transfer of basic information between healthcare providers due to the dispersal of clinical and professional responsibilities among various healthcare team members.

The field of patient information handovers, patient transmissions, and continuity of care had become so important by 2008 that Joint Commission International (JCI) included handoffs in the National Goal of ensuring patient safety (Friesen, White, Byers, 2008; Halm, 2013). Patient clinical handover or transfer includes both the transmission of and assumption of responsibility for patient care, which can be achieved by effective communication. It means the handover of specific information about the patient in real time, taking place between nurses or nursing teams, to ensure the continuity and safety

of patient care (Cohen, Hilligoss, 2010).

The term *clinical handover (handoff)* is used for handover of patient information between two shifts, in cases when the health status of a patient deteriorates, and at the handover of a patient from or to a higher level of care (e.g. from an ambulance to an urgent care facility) and is closely associated with the handover of control and responsibility. Another term – *transfer* – is used for the handover of patients and related responsibilities to a department with a different specialization within a hospital. The term *clinical handover* distinguishes the standard routine of communication from the more complex reviews during ward rounds or other more concentrated communications, such as consultations (Cohen, Hilligoss, 2010). In 2008, JCI processed requirements that should contribute to achieving goals in the area of patient safety at hospitals:

Interactive communication between the person handing over patient information and the recipient of the information, providing a chance to ask questions.

Topical information on nursing and medical care, and services provided to patients, their health status, and any recent or expected changes.

Process of verifying accepted information, including its repetition or, if necessary, re-reading.

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Opportunities for information recipients to find out relevant historical data on patients that might include previous nursing and medical treatment, and services. Interruptions in the course of handovers are kept to a minimum to reduce the possibility that information will not be transferred or will be forgotten (Friesen, White, Byers, 2008).

In the Czech Republic, the requirement of ensuring patient safety during transfers and handovers is laid down in Regulation § 47, par. 3 (b), Act 372/2011 on health services and conditions for their provision. (Zákon 372/2011) A detailed methodology and requirements are published in the Bulletin of the Ministry of Health, No. 16/2015 as Sectoral Safety Goal 7 – Safe Patient Handovers (Věstník 16/2015). Within the National System of Reporting Adverse Events in the Czech Republic, the adverse events associated with patient transfers and handovers can be included under the category of clinical administration, and, according to specific events, under the categories of clinical intervention, records and sources/management of the organization (Pokorná et al., 2017).

Implementation of the goal: *Patient safety at handovers* requires organizations to introduce a standardized approach to communication at handovers, providing opportunities to ask and answer questions (Friesen, White, Byers, 2008; Cohen, Hilligoss, 2010). However, according to Cohen, Hilligoss (2010), it is not entirely clear what should be included in the handover, how the concept of standardization should be interpreted, and how great the safety gains for a patient can be reliably expected to be from improvements in transmission of information. Some concern has been expressed over possible unintended consequences of a standardized approach, and attention has been drawn to the fact that pre-prepared checklists do not enable classification according to level of importance and might be used instead of verbal updates in busy periods. A developed template can change the character of the whole process from a *bilateral interaction* to a *unilateral transaction*. As a result, patient safety can be impaired, and fewer questions asked and explained (Perry, Wears, Patterson, 2008). For difficult situations, e.g. uncertain diagnoses or uncertain course of the disease, a system describing the development in time, interconnecting specific events, and emphasizing their interrelations would appear to be more effective (Horsky et al., 2015).

The complexity of these processes is also confirmed by a study performed by Machaczek et al. (2013) in the Czech Republic. The results suggest that the insufficient quality of medical handover records has

a particularly negative impact on information handover. Social relationships and differences in the status of clinicians can also have a negative impact on handovers. While handovers are strongly influenced by context, results show that work settings do not support clinical staff's efforts to perform handovers effectively. Though nursing handovers are performed in a more standardized way than medical handovers, results do not support the idea that standardization improves the level of information provided. Lack of time, poor planning with regard to staffing, and interruptions in work processes have proven to be the main obstacles.

An extensive questionnaire study performed by the Faculty of Healthcare and Social Studies, South Bohemian University, České Budějovice found that 43.9% of staff nurses admitted to problems with information exchange between hospital wards, 88.0% did not believe that information was lost during shift handovers, and 84.1% did not believe that information was lost during transfers of patient to other wards (Brabcová et al., 2015).

## Aim

The aim of this study is to present a current overview of lessons learned regarding approaches to increasing patient safety and ensuring continuity of care during clinical transmission and transfers, and risk reduction initiatives and their results.

We decided to study this sectoral safety goal in the belief that it is difficult to ensure the safe passage of patients through a healthcare facility due to a number of factors influencing handovers, and, at the same time, that it is difficult to determine and introduce effective strategies to reduce the number of associated adverse events.

Hilligoss, Cohen (2013) draw attention to several factors influencing the context of handovers, including, in particular, the relative complexity of cases, the character and quality of the relationship between the parties participating in handovers, the disciplinary perspectives involved, and the nature of the communication media.

Answers to the following questions were sought:

Are approaches to communication during patient information handovers standardized?

How do the introduction of checklists and safety protocols influence the quality of information handed over, and patient safety?

## Methods

### Design

Descriptive summarizing study.

## Sources

To accomplish our aims, secondary data analysis was performed. PubMed, Science Direct, Embase and Google Scholar databases were studied.

## Search

The key words handover, handoff, checklist, patient, and change-of-shift were used.

## Eligibility criteria

Papers published in English over the past five years were focused on. In the period mentioned, 1,432 articles have been published.

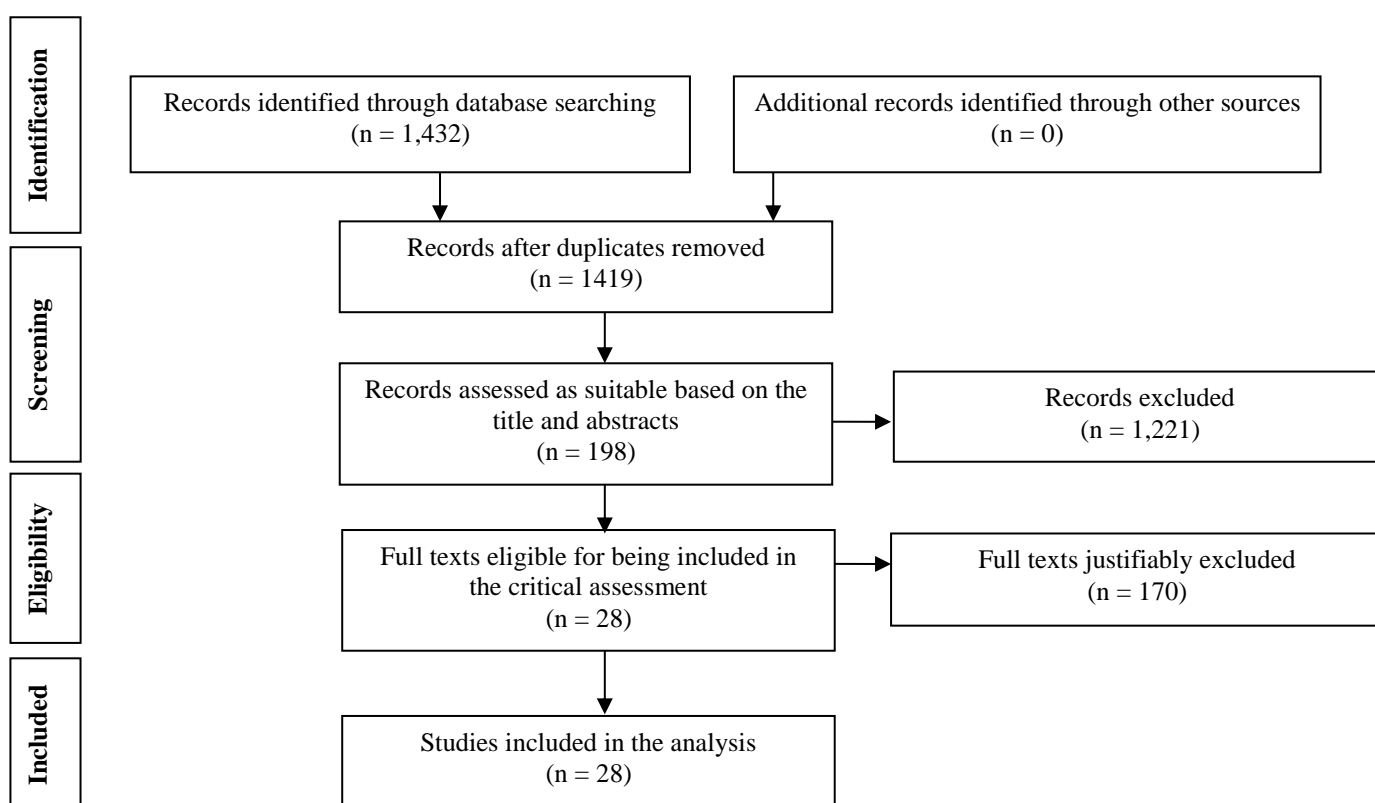
## Data analysis and study selection

Based on an extensive search, full texts of partial studies and discussion papers were included in the overview. The overview included papers dealing with the effectiveness of patient information transfer between members of staff, teams, and healthcare providers. Following analysis of available publications, we found that 28 articles corresponded

with the main criterion, i.e., patient safety at patient handovers and transfers (handoffs). For gradual exclusion of studies, *PRISMA* recommendations were followed, as shown in Figure 1.

The level of the evidence was assessed in accordance with the Joanna Briggs Institute (JBI), since both qualitative and quantitative research is dealt with (Klugar, 2015). The evaluation included studies of evidence levels two, three, and four (two – quasi-experimental designs and qualitative or mixed synthesis methods, three – observational – analytic designs and qualitative methods of a primary research, four – observational – descriptive designs).

Theses or similar studies and papers on different topics, e.g., topics focusing on staff safety, dealing with emergent situations, teaching materials, etc., were excluded from our study. Similarly, papers that were not available as full texts, and papers that did not, after detailed analysis, contain sufficient relevant information were excluded.



**Figure 1** Flowchart – recommendation by PRISMA

## Results

The decisive feature distinguishing clinical handover from other patient communication is the transfer of responsibility or control from the communicator to the receiver. This also entails the need to briefly convey what it is necessary for the other party responsible for the next course of patient treatment to know, i.e., information on current health status, recent or expected changes, and the follow-up care the patient requires (Cohen, Hilligoss, 2010).

Non-effective communication at the handover creates the opportunity for the development of adverse events, since incomplete, incorrect or omitted data can produce ambiguity. Efforts to improve communication to ensure continuity of care and the quality of handed-over information may lead to

the introduction of standardized protocols including mnemonic lists and checklists, which will become important tools for patient safety (Cohen, Hilligoss, 2010; Starmer et al., 2012; Hilligoss et al., 2013).

In a search of the literature, we found that in various combinations and models, the effectiveness of *SBAR* (Situation, Background, Assessment, Recommendation), *I-PASS* (Illness severity, Patient summary, Action list, Situation awareness and contingency planning, Synthesis by receiver), body system models, and models for trauma patients had been tested. The assessments of proposed standardized protocols were performed in various types of facilities, most frequently at ICUs (intensive care units) and emergency departments. An overview of the technologies is shown in Table 1 Part I and II.

**Table 1** Characteristics of studies included in the analysis (Part I)

Authors (year)	Method of information handover (content arrangement)	Clinical area	Degree of the evidence	Number of participants, handover sessions
Abraham et al. (2015)	list of body systems	intensive care	2	16 staff nurses, 7 patients, 15 handovers
Abraham et al. (2013)	HAND IT (list of body systems) and SOAP (subjective and objective assessment of patient condition)	intensive care	3	41 handovers per each tool
Achrekar et al. (2016)	SBAR	unlimited	3c	20 a 19 staff nurses
Arumugam et al. (2016)	SBAR	standard ward	2c	83 staff nurses
Ashcraft, Owen (2017)	SBAR in an electronic record	emergency, standard ward, nursing homes	2d	56 persons in a control and intervention group
Banihashemi et al. (2015)	SBAR	intensive care	4b	45 staff nurses and 15 doctors
Birmingham, Buffum, Blegen (2015)	SBAR and list of systems	unlimited	3	21 staff nurses
Blower et al. (2014)	electronic tool with recommended RCSE (Royal College of Surgeons) elements	surgical ward	3c	118 a 114 handovers
Ebben et al. (2015)	DeMIST – demography, mechanism of injury or illness, symptoms, treatment	emergency	3c	88 experts, 314 handovers in two phases
Fabila et al. (2016)	SBAR – inclusion in the PETS handover protocol	cynaecology-obstetrics, intensive care unit	3e	44 staff nurses
Heilman et al. (2016)	IPASS	emergency	2	4 control groups of 4 – 8 persons each
Hesselink et al. (2014)	IPASS	emergency	3	26 dialogues and 321 individual dialogues with patients and SOs

**Table 2** Characteristics of studies included in the analysis (Part II)

Authors (year)	Method of information handover (content arrangement)	Clinical area	Degree of the evidence	Number of participants, handover sessions
Hunter et al. (2017)	SBAR	surgery, operating room	3	23 handovers
Inanloo, Mohammadi, Haghani (2017)	SBAR	intensive care	2c	53 staff nurses
Jain, Yadav (2017)	SBAR	intensive care	3c	120 persons
Kumar et al. (2016)	SBAR	neuro-scientific centre	3	525 handovers
LeBlanc et al. (2014)	standardized protocol for traumatology handovers	surgery, orthopaedics	4b	247 respondents
Lee, Desai, Phan (2017)	SBAR	internal unit	3	30 participants, 134 handovers
Moore et al. (2017)	ISBAR (identification, situation, background, assessment, recommendation)	community and hospital facilities, air service	4b	40 and 48 phone records (two and four per person)
Nagammal et al. (2017)	SBAR	cancer centre	4b	117 staff nurses
Lane-Fall et al. (2014)	SBAR, SOAP (subjective and objective assessment of patient condition) and format of standard medical evidence	intensive care	3	30 persons
Randmaa et al. (2017)	SBAR a control safety list in surgery WHO	intensive care	3	6 groups with 23 persons
Sujan et al. (2017)	ATMIST (age, time, and mechanism if injury, primary treatment)	ambulance service, emergency	3	203 handovers
Starmer et al. (2014)	IPASS	paediatrics	3d	432 handover documents, 207 sound records
Malekzadeh et al (2013)	Handover protocol according to Joint Commission International standards	intensive care	2d	56 staff nurses
Ting et al. (2017)	SBAR and standardized questionnaire for SAQ (Safety Attitudes Questionnaire)	obstetrics	3c	29, 34 a 33 staff nurses
Wollenhaup et al. (2017)	SBAR and a modified tool for handovers	obstetrics	3c	28 staff nurses, 50 handovers
Yu, Kang (2016)	SBAR	academic setting	4b	137 persons

*Degree of evidence: 2c – quasi-experimental prospective controlled study, 2d – pre-test -post-test or retrospective controlled groups, 3c – cohort studies with a control group, 3d – controlled case studies, 4b – profile studies, 2 – qualitative studies or a synthesis of various methods, 3 – qualitative studies (primary research); SBAR (situation, background, assessment, recommendation); I-PASS (importance of the illness, sum of patient information, activity list, emergency planning, summary by the recipient)*

## Discussion

SBAR (or the modified ISBAR version) is, due to its brevity, suitable for situations demanding fast decision-making. It is recommended when handing over information between individual shifts or during patient transfers (Starmer et al., 2014; Moore et al., 2017).

Positive results of using SBAR in combination with other methods are described by Achrekar et al. (2016); Fabila et al. (2016); Kumar et al. (2016); Ting et al. (2017).

Improvements in the effectiveness of handovers, and healthcare staff's responsibility for patient safety are documented by a study evaluating SBAR components during report handovers. By integrating the tool, reliability improved from 54.5% to 83.73% (Arumugam et al., 2016). The study participants themselves mentioned that the use of mnemonic lists improved awareness and reduced discrepancies and errors (Arumugam et al., 2016; Fabila et al., 2016).

A Swedish group of experts failed to demonstrate any improvement in information handovers in postoperative care (Randmaa et al., 2017).

The results of the study by Fabila et al. (2016) suggest that the new *PETS* (pre-handover, equipment, timeout, and sign out) protocol integrating the *SBAR* form optimizes interdisciplinary communication and the passing on of important information between operating team members and pediatric ICU members at handovers. The construction of the new protocol reduced ambiguity, and facilitated the process of distinguishing between missing, and inadequate information.

*I-PASS* technology is an option for the transfer of information regarding complicated cases requiring wider information and context. The mnemonic-technology provides a framework for the process of patient handovers (I – importance of the disease; A – activity list; S – situation description; S – summarizing by the recipient). Starmer et al. (2014) performed an intervention study focusing on the degree of failure of nursing care processes, unintentional adverse events, and miscommunication. Implementation of the *I-PASS Handoff Bundle* includes mnemonic techniques for the standardization of verbal and written handovers, training in communication skills and team work, a didactic interactive workshop, stimulation training, a computer learning module, and materials and tools for a campaign to change culture. The evaluation results were based on assessment of handover records. The work procedures were assessed by observation. The number of medical errors was reduced by 23%, and the rate of unintentional adverse events that could cause harm to patients was reduced by 30%. The significant increase in the number of written documents and verbal communication at handovers improved communication without any negative impact on working methods.

The mnemonic characteristics of *I-PASS* may also be acceptable in urgent care workplaces (Heilman et al., 2016), after making certain modifications that take into account their dynamic nature and time constraints.

Mnemonic learning methods and structures for information transfer are also applied by tools based on the use of computer and web-operated systems. Options for their application are published, for example, by Cohen, Hilligoss (2010); Blower et al. (2014); Ebben et al. (2015); Jain, Yadav (2017).

The study published by Blower et al. (2014) has demonstrated a statistically significantly more efficient transmission process using electronic forms, thus improving patient safety, increasing the level and continuity of care, reducing the length of stay in hospital, and increasing the educational value of handover.

The structured *HAND-IT* (Handoff Intervention Tool), whose content categories are organized according to the importance and relevance for working procedures in intensive care (including physical examinations, laboratory tests, medication, diagnostic and therapeutic regimen for each body system) improves the ability of the handing-off staff to react quickly to the requirements and questions of the recipients, thereby accelerating problem-solving and decision-making processes (Abraham et al., 2013).

The main recommendations for using the DeMIST model (demographics, injury or disease mechanism, injury or disease, symptoms, treatment) stem from the ability to structure information received from pre-hospital care for handing over at urgent admissions. However, although the results of the study demonstrate a relatively high degree of suitability for use and the correct sequence, its use did not improve compliance with instructions for patient handover at urgent admissions, such as the transfer of responsibility between professionals, an uninterrupted transfer process, or verification that information was understood (Ebben et al., 2015).

The participants in the Swedish study felt that use of electronic records was complicated and time-consuming, and resulted in the loss of overview of patients' conditions (Randmaa et al., 2017).

During the analysis of the literature, we found that a number of studies dealt with checklists and protocols. Calls for the standardization of structured information handovers are supported by a British randomized study. The suitability of checklists for handovers is explained by the fact that memory signals maintain recall of clinical information, especially in situations in which, due to even short-term psychological fatigue and cognitive burden on healthcare professionals, information is lost (Flindall et al., 2016).

Evaluations of the effectiveness of handovers generally focus on three areas: structure, clinical content, and interruptions in communication. The structure of communication enables the identification of conversational strategies (cooperation) during patient information transfer and the development of a common base. The content of communication determines the clinical character of the dialogues.

Interruptions in communication are used as an alternative measure for communication gaps during the handover (Abraham et al., 2015).

Participants in the Swedish study confirmed that written information improved memory. As part of the introduced handover structure, they were expected

not only to receive information, but also to ask questions in a structured way during the handover rather than after it had ended (Randmaa et al., 2017).

The introduction of standardized and structured protocols for shift information handovers leads to effective and regular communication, supports continuity of care (Malekzadeh et al., 2013), and prevents re-admissions to ICUs from standard units (van Sluisveld et al., 2017), and to hospital from primary care provision, etc. (Hesselink et al., 2014).

Malekzadeh et al. (2013) suggest adapting protocols to specific settings. The study, focusing on the introduction of a shift handover protocol to an ICU, improved the staff nurses' awareness of patient needs, and the quality of nursing care. Lane-Fall et al. (2014) draw attention to the fact that handover communication should reflect the various participants' roles, including differences in structure and content. Similarly, LeBlanc et al. (2014) recommend using standardized checklists that are specific to patient needs, to enable safe handovers. The results of the study demonstrate that to achieve patient safety during handovers, the most important aspects include: comorbidity, diagnosis, readiness for theatre, stability, mechanism of injury, and unresolved problems. They particularly recommend the preoperative checklist for orthopedic surgery.

On the other hand, correlations between the procedures performed during discharge from ICU (such as verbal and written handoffs, discharge planning, monitoring post injection treatment, education, etc.) and the number of re-admissions to the ICU within 48 hours were not confirmed by a Dutch study (van Sluisveld et al., 2017).

Though more than 90 % of respondents who participated in that questionnaire study regarded the checklist as useful, in the same group of respondents, negative attitudes to checklists were identified as an obstacle to their use (van Sluisveld et al., 2017).

We are aware that the presented overview of available literature is limited primarily by its focus, i.e., on areas relating to the transfer of information between staff, teams or care providers, in connection with clinical handovers or patient transfers.

## Conclusion

Based on the study of available literature, we attempted to answer the question of whether in practice, standardized approaches to communication are used during patient handovers. Although our conclusions are not entirely unambiguous, it can be seen that mnemonic methods

are quite widespread, and despite certain pitfalls arising, for example, from inappropriate use or neglect of certain parts by users, they appear to be effective, and there are efforts to apply them in electronic information handover.

As evidenced by the results the studies presented, the integration of standardized protocols may not, in itself, solve problems associated with information handovers. At protocol implementation, the general context of the communication model and possible barriers resulting from the character of the setting or excessive stress should be taken into consideration.

Information on the handover of patient information can be regarded as the starting point for further, more detailed studies that will focus more on the positive aspects of handover safety.

## Ethical aspects and conflict of interest

The authors declare that the presented manuscript has been neither published nor offered for publication to any other publishers, and the development and publication of this paper do not cause any conflict of interests, and the article has not been supported by any firm.

## Author contribution

Conception and design (RP, SB), data analysis and interpretation of data (RP), drafting the manuscript (RP), critical revision of the manuscript (SB), the final completion of the article (RP, SB).

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