# Evidence-based Practice Center Rapid Review Protocol

## Project Title: *Making Healthcare Safer IV: Use of Structured Handoff Protocols for Intrahospital Transitions*

## Review Questions

### Review Question

Based on the evidence published during the included dates, how effective are handoff protocols, and what are the unintended effects.

### Contextual Questions

1. How do handoff protocols prevent or mitigate harms?
2. What are common barriers and facilitators to implementation of handoff protocols?
3. What resources (e.g., cost, staff, time) are required for implementation of handoff protocols?
4. What toolkits are available to support implementation of handoff protocols?

## Context and Domain Being Studied

The Agency for Healthcare Research and Quality (AHRQ) Making Healthcare Safer (MHS) reports consolidate information for healthcare providers, health system administrators, researchers, and government agencies about PSPs that can improve patient safety across the healthcare system—from hospitals to primary care practices, long-term care facilities, and other healthcare settings. In Spring of 2023, AHRQ launched its fourth iteration of the MHS Report (MHS IV).

The topic of handoff protocols was identified as high priority for inclusion in the MHS IV reports using a modified Delphi technique by a Technical Expert Panel (TEP) that met in December 2022. In the prioritization process, the MHS IV TEP defined the scope of handoffs to "intrahospital transitions." The TEP included 15 experts in patient safety with representatives of governmental agencies, healthcare stakeholders, clinical specialists, experts in patient safety issues, and a patient/consumer perspective. See the MHS IV Prioritization Report for additional details.[1]

## Overview of the Topic

The handoff (sometimes called handover) of patient care from one clinician to another has been defined as "a standardized method for transferring information, along with authority and responsibility, during transitions in patient care".[2] There is no single patient safety outcome metric used to assess the effectiveness of handoffs. As noted by Robertson and colleagues "handover failures typically contribute to a cascade of failures involved in adverse outcomes, rather than being sole causes, making the estimation and investigation of handover-derived harms difficult".[3] Nevertheless, poor communication, including poor communication during a handoff, is one of the most common causes of medical errors, according to The Joint Commission (TJC). The TJC reports that communication failures in US hospitals were responsible at least in part for 30% of all malpractice claims and more than 1700 deaths over 5 years.[4] Improving handoffs has been a Joint Commission National Patient Safety goal since 2006. The use of structured protocols has been advocated to improve handoffs.

The earliest editions of Making Healthcare Safer did not focus on handoffs, but discussed them as a component of other patient safety topics. In Making Healthcare Safer II, handoffs were discussed in Team-Training and Limiting Provider's Hours of Service.[5] In Making Healthcare Safer III, handoffs were discussed in "Cross-cutting PSPs".[6] Three studies of handoff protocols were reviewed, two of which reported on provider satisfaction, knowledge, skills and attitudes but not on patient safety outcomes. The one study that reported patient outcomes found statistically insignificant differences (measured in seconds) in the time to place patients on a ventilator or a monitor when a

standardized handoff tool was used during patient transfers from the operating room to the surgical ICU.

Transitions in care, such as from the emergency room to the inpatient setting, or from the Intensive Care Unit to the general medical-surgical floor, or from the post-anesthesia recovery area to the general floor, have long been recognized as handoffs in need of structure and protocols, with original research studies and systematic reviews of original research studies available.[7-14] These “between unit” handoffs have been recognized as having features distinct from “within unit” handoffs.[15] For example, what triggers the transition in the former is a change in patient illness trajectory such that the patient needs a different type of care, whereas in the latter the handoff is regularly triggered by change of shift. Additionally, between unit handoffs involve an entirely new team and different modes of care, whereas within unit handoffs are about temporal boundaries in a shift. Thus, there are conceptual differences between the two kinds of handoffs. There are more published reviews for between-unit handoffs than within-unit handoffs, making the latter a prime opportunity for a rapid review to add to the knowledge about structured handoffs.

From two recent review articles on health care handoffs,[16, 17] information from The Joint Commission,[4] a list of handoff tools from Pediatrics vol 135,[18] and our own search for structured handoff protocols on PSNet, we selected twelve structured handoff tools as targets for this review:

1. IMIST-AMBRO (Identification/introduction, Mechanism of Injury/Medical complaint, Injuries/information related to complaint, Signs and symptoms, Treatment given/trends noted, Allergies, Medications, Background history, Other information);

2. IPASS (Illness severity, Patient summary, Action list, Situational awareness, Synthesis by receiver);

3. ICATCH (Identify patient, Characterize situation, Action – what was done overnight, To do for the team in the morning, Confirm the handoff);

4. 3. Prep 4 C’s (Preparation, Contact, Communicate, Closing the loop, Conclusion);

5. SBAR (Situation, Background, Assessment, Recommendation) – note there are several variants of this, such as ISBAR and SBARR);
6. Safer Sign Out; and
7. Patient Handoff Toolkit.
8. Targeted solution tool – The Joint Commission Center for Transforming Healthcare's targeted solution tool.
9. PSYCH – (Patient information, Situation leading to hospitalization, Your assessment, Critical information, and Hindrance to discharge)
10. ABC of Handover
11. HANDOFFS (Hospital location, Allergies/Adverse reactions, Name, DNR, Ongoing problems, Facts about this hospitalization, Follow-up on…, Scenarios)
12. SIGNOUT (Sick or DNR, Identifying data, General hospital course, New Events of the day, Overall health status, Upcoming possibilities with plan/rationale, Tasks to complete overnight with plan/rationale.

One of these tools, SBAR, has an existing systematic review published in 2018.[19] No systematic reviews specific to the other tools were identified. A review protocol was published in 2018 on the IPASS tool[20] but no review has been published in the intervening 6 years.

## Purpose of the Review

The purpose of this rapid review is to assess the effectiveness of "within unit" structured handoff protocols on patient safety outcomes for adult inpatients.

## Methodologic Approach

For this rapid review, strategic adjustments will be made to streamline traditional systematic review processes and deliver an evidence product in the allotted time. We will

follow adjustments and streamlining processes proposed by the AHRQ Evidence-based Practice Center (EPC) Program. Adjustments include being as specific as possible about the questions, limiting the number of databases searched, modifying search strategies to focus on finding the most valuable studies (i.e., being flexible on sensitivity to increase the specificity of the search), and restricting the search to studies published in the last 10 years in English and performed in the United States, and having each study assessed by a single reviewer. We will be using the artificial intelligence (AI) feature of DistillerSR (AI Classifier Manager) as a second reviewer at the title and abstract screening stage, as described below in the section on Data Extraction.

We will search for recent high quality systematic reviews as defined by the US Preventive Services Task Force and will rely primarily on the content of any such systematic review that is found. We will not perform an independent assessment of original studies cited in any such systematic review.

For contextual questions 1 (rationale), 2 (barriers and facilitators), and 3 (resources), we will draw on information reported in the studies identified by the Review Question.

For contextual question 4, we will identify publicly available patient safety toolkits developed by AHRQ or other organizations that could help to support implementation of the PSPs. To accomplish that task, we will review AHRQ's Patient Safety Network (PSNet) (https:/psnet.ahrq.gov) and AHRQ's listing of patient safety related toolkits (https://www.ahrq.gov/tools/index.html?search_api_views_fulltext=&field_toolkit_topics=14170&sort_by=title&sort_order=ASC) and we will include any toolkits mentioned in the studies we find for the Review Question. We will identify toolkits without assessing or endorsing them.

## Eligibility Criteria

We will search for original studies and systematic reviews on the Review Question according to the inclusion and exclusion criteria presented in Table 1.

**Table 1. Inclusion and Exclusion Criteria**

| Study Parameter | Inclusion criteria | Exclusion criteria |
|---|---|---|
| **Population** | Adult and pediatric inpatients | Outpatients |
| **Intervention** | One of the twelve above listed structured handoff tools I, used for handoffs within unit, with the possibility that more Tools may be identified | Between unit transfers |
| **Comparator** | Usual care | NA |
| **Outcome** | Patient safety clinical outcomes | Non-clinical outcomes such as provider satisfaction, knowledge, etc. |
| **Timing** | Within hospital stay | NA |
| **Setting** | Acute care hospitals | All other settings |
| **Type of studies** | RCTs, Stepped wedge studies, time series studies, possibly pre/post studies if there are few to zero studies of stronger internal validity, systematic reviews | Qualitative studies, pre/post studies (if there are adequate numbers of studies of stronger internal validity) |

## Literature Searches

Our search strategy will focus on databases expected to have the highest yield of relevant studies, including PubMed and EMBASE, supplemented by a narrowly focused search for unpublished reports that are publicly available from governmental agencies or professional societies having a strong interest in the topic. As this topic has not been discussed in detail in prior editions of MHS, we will expand our search to the past 10 years. The full search strategy conducted to date is available in Appendix A.

## Data Extraction

To efficiently identify studies that meet the eligibility criteria, we will have the title and abstract of each citation reviewed by a single team member. We will use the DistillerSR AI Classifier Manager as a semi-automated screening tool to conduct the review efficiently at the title and abstract screening stage. In that case, the team will generate the training set by manual review of titles and abstracts, the AI Classifier Manager will then create a predicted probability for the remaining titles and abstracts, and the team will manually screen these, in deciles of predicted probability of inclusion, starting with the most probable (meaning start with 1.0, then move on to 0.9, then 0.8, etc.) until a decile is reached where no titles/abstracts are included. All titles and abstracts with lower predicted probability will be rejected, but a 10% sample will be manually reviewed to confirm this.

Information will be organized according to the review questions, and will include author, year, study design, frequency and severity of the harms, measures of harm, characteristics of the PSP, rationale for the PSP, outcomes, unintended consequences, implementation barriers and facilitators, required resources, and description of toolkits. To streamline data extraction, we will sort eligible studies by handoff protocol (for example, if the same tool is the subject of more than one study), and focus on extracting information about characteristics, outcomes, and barriers/facilitators most pertinent to a specific tool.

## Risk of Bias Assessment

For studies that address the Review Question about the effectiveness of PSPs, the primary reviewer will use the Cochrane Collaboration's tool for assessing the risk of bias of randomized controlled trials (RCTs) or the ROBINS-I tool for assessing the Risk Of Bias In Non-randomized Studies – of Interventions.[21, 22] When assessing RCTs, we will use the 7 items in the Cochrane Collaboration's tool that cover the domains of selection bias, performance bias, detection bias, attrition bias, reporting bias, and other bias.[21] When assessing non-randomized studies, we will use specific items in the ROBINS-I tool that assess bias due to confounding, bias in selection of participants into the study, bias in classification of interventions, bias due to deviations from intended interventions, bias due to missing data, bias in measurement of outcomes, and bias in selection of the reported results.[22] The risk of bias assessments will focus on the main outcome of interest in each study.

If we identify a recent eligible systematic review, the primary reviewer will use the criteria developed by the United States Preventive Services Task Force Methods Workgroup for assessing the quality of systematic reviews.[23]

- **Good** - Recent relevant review with comprehensive sources and search strategies; explicit and relevant selection criteria; standard appraisal of included studies; and valid conclusions.

- **Fair** - Recent relevant review that is not clearly biased but lacks comprehensive

sources and search strategies.

- **Poor** - Outdated, irrelevant, or biased review without systematic search for studies, explicit selection criteria, or standard appraisal of studies.

The Task Leader will review the risk of bias assessments and any disagreements will be resolved through discussion with the team.

## Data Synthesis

Selected data will be compiled into evidence tables and synthesized narratively. We will not conduct a meta-analysis. To be included, a structured handoff tool needs to be assessed in more than 1 study or setting (i.e., a single study with multiple sites of different type would be included). As these kinds of organizational changes are known to be context-dependent, if there is only 1 study in 1 context it is impossible to assess the effect of the tool across contexts. For the Review Question about the effectiveness of PSPs, we will record information about the context of each study and whether the effectiveness of the PSP differs across patient subgroups. If any of the PSPs have more than one study of effectiveness, we will grade the strength of evidence for those PSPs using the methods outlined in the AHRQ Effective Health Care Program (EHC) Methods Guide for Effectiveness and Comparative Effectiveness Reviews.[24] Evidence grading would not add value for PSPs that do not have more than one available study.

## Analysis of Subgroups or Subsets

We will report if the effectiveness of the PSP differs across patient subgroups or settings, but will not conduct subgroup analyses.

## Registration

We will submit the protocol to AHRQ and to the PROSPERO international prospective register of systematic reviews.

## EPC Team Disclosures

EPC core team members must disclose any financial conflicts of interest greater than $1,000 and any other relevant business or professional conflicts of interest. Related financial conflicts of interest that cumulatively total greater than $1,000 will usually disqualify EPC core team investigators from participation in the review.

## External Peer Reviewers

Peer reviewers are invited to provide written comments on the draft report based on their clinical, content, or methodological expertise. The EPC considers all peer review comments on the draft report in preparation of the final report. Peer reviewers do not participate in writing or editing of the final report or other products. The final report does not necessarily represent the views of individual reviewers.

We will ask at least one clinical content expert and one methodological expert to review the draft report. Potential peer reviewers must disclose any financial conflicts of interest greater than $5,000 and any other relevant business or professional conflicts of interest. Invited peer reviewers may not have any financial conflict of interest greater than $5,000.

## Role of the Funder

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# Appendix A. Preliminary Search Strategies for Systematic Reviews

## PubMed

| Set # | Search | # of results |
|---|---|---|
| 1 | "structured handoff*"[tiab] OR "structured hand off*"[tiab] OR "structured handover*"[tiab] OR "structured hand over*"[tiab] "clinical handoff*"[tiab] OR "clinical hand off*"[tiab] OR "clinical handover*"[tiab] OR "clinical hand over*"[tiab] OR "patient handoff*"[tiab] OR "patient hand off*"[tiab] OR "patient handover*"[tiab] OR "patient hand over*"[tiab] OR "patient signout*"[tiab] OR "patient sign out*"[tiab] OR "patient signover*"[tiab] OR "patient sign over*"[tiab] OR "nursing handoff*"[tiab] OR "nursing hand off*"[tiab] OR "nursing handover*"[tiab] OR "nursing hand over*"[tiab] OR "nurse handoff*"[tiab] OR "nurse hand off*"[tiab] OR "nurse handover*"[tiab] OR "nurse hand over*"[tiab] OR "physician handoff*"[tiab] OR "physician hand off*"[tiab] OR "physician handover*"[tiab] OR "physician hand over*"[tiab] OR "clinician handoff*"[tiab] OR "clinician hand off*"[tiab] OR "clinician handover*"[tiab] OR "clinician hand over*"[tiab] OR "clinical handoff*"[tiab] OR "clinical hand off*"[tiab] OR "clinical handover*"[tiab] OR "clinical hand over*"[tiab] OR "shift handoff*"[tiab] OR "shift hand off*"[tiab] OR "shift handover*"[tiab] OR "shift hand over*"[tiab] OR "intershift handoff*"[tiab] OR "intershift hand off*"[tiab] OR "intershift handover*"[tiab] OR "intershift hand over*"[tiab] OR "shift report*"[tiab] OR "transitional care"[tiab] OR "change shift report"[tiab:~2] OR "change shift communication"[tiab:~2] OR "handoff communication*"[tiab] OR "hand off communication*"[tiab] OR "handover communication*"[tiab] OR "hand over communication*"[tiab] OR "Patient Handoff"[Mesh] | 5,013 |
| 2 | "patient safety"[tiab] OR safe*[ti] OR "patient harm*"[tiab] OR "Patient Safety"[MAJR] OR "Patient Harm"[MAJR] | 255,376 |
| 3 | checklist*[tiab] OR "check list*"[tiab] OR guideline*[tiab] OR intervention*[tiab] OR practice*[tiab] OR procedure*[tiab] OR protocol*[tiab] OR policy[tiab] OR policies[tiab] OR path*[tiab] OR standard*[tiab] OR structured*[tiab] OR tool*[tiab] OR "Checklist"[MAJR] OR "Practice Guidelines"[MAJR] | 9,747,973 |
| 4 | #1 AND #2 AND #3 | 721 |
| 5 | Address[pt] OR Autobiography[pt] OR Bibliography[pt] OR Biography[pt] OR "Clinical Trial Protocol"[pt] OR "Clinical Trial, Veterinary"[pt] OR "Collected Work"[pt] OR Comment[pt] OR Congress[pt] OR "Consensus Development Conference"[pt] OR "Consensus Development Conference, NIH"[pt] OR Dataset[pt] OR Dictionary[pt] OR Directory[pt] OR "Duplicate Publication"[pt] OR Editorial[pt] OR "Electronic Supplementary Materials"[pt] OR "Equivalence Trial"[pt] OR "Expression of Concern"[pt] OR Festschrift[pt] OR "Historical Article"[pt] OR "Interactive Tutorial"[pt] OR Interview[pt] OR "Introductory Journal Article"[pt] OR Lecture[pt] OR "Legal Case"[pt] OR Legislation[pt] OR Letter[pt] OR News[pt] OR "Newspaper Article"[pt] OR "Observational Study, Veterinary"[pt] OR Overall[pt] OR "Patient Education Handout"[pt] OR "Periodical Index"[pt] OR "Personal Narrative"[pt] OR Portrait[pt] OR Preprint[pt] OR "Published Erratum"[pt] OR "Randomized Controlled Trial, Veterinary"[pt] OR "Retracted Publication"[pt] OR "Retraction of Publication"[pt] OR "Twin Study"[pt] OR "Video-Audio Media"[pt] OR Webcast[pt] | 3,294,818 |
| 6 | #4 NOT #5 | 714 |
| 7 | #6 AND (humans[Filter]) AND (2013/1/1:2024/12/31[pdat]) AND (english[Filter]) | 509 |
| 8 | "systematic review"[ti:~3] OR "systematic reviews"[ti:~3] OR ((systematic[tiab] OR scoping[tiab]) AND review[pt]) OR "systemic review*"[ti] OR "systematical review*"[ti] OR "meta analy*"[tiab] OR metaanaly*[tiab] OR metasynthes*[tiab] OR "meta synthes*"[tiab] OR ((systematic[ti] OR scoping[ti] OR metanaly*[ti] OR metasynth*[ti] OR "meta analy*"[ti] OR "meta synth*"[ti] OR evidence[ti] OR Cochrane[ti] OR literature[ti]) AND (review*[ti] OR synthes*[ti] OR map[ti] OR mapping[ti])) OR "systematic review"[pt] OR "systematic review"[sb] OR meta-analysis[pt] OR "literature review"[ti:~2] OR "rapid review"[ti:~2] OR "umbrella review"[ti:~2] OR "evidence review*"[ti] OR "scoping review*"[ti] OR "literature scan*"[ti] OR "Systematic Reviews as Topic"[Mesh] OR "Meta-Analysis as Topic"[MeSH] OR "Review Literature as Topic"[MeSH] | 729,970 |
| 9 | #7 AND #8 | **47** |