The published literature on handoffs in hospitals: deficiencies identified in an extensive review

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ABSTRACT

Background In hospitals, handoffs are episodes in which control of, or responsibility for, a patient passes from one health professional to another, and in which important information about the patient is also exchanged. In view of the growing interest in improving handoff processes, and the need for guidance in arriving at standardised handoff procedures in response to regulatory requirements, an extensive review of the research on handoffs was conducted.

Methods The authors have collected all research treatments of hospital handoffs involving medical personnel published in English through July 2008.

Results A review of this literature yields four significant conclusions: (1) the definition of the handoff concept in the literature is poorly delimited; (2) the meaning of 'to standardise' has not been developed with adequate clarity; (3) the literature shows that handoffs perform important functions beyond patient safety, but the trade-offs of these functions against safety considerations are not analysed; (4) studies so far do not fully establish that attempts at handoff standardisation have produced marked gains in measured patient outcomes.

Conclusion The existing literature on patient handoffs does not yet adequately support either definitive research conclusions on best handoff practices or the standardisation of handoffs that has been mandated by some regulators.

With the steadily increasing interest in patient safety and quality of care, a focus of research and regulatory attention has emerged that concentrates on the moments when health professionals 'hand off' patients to one another. These crucial points of discontinuity seem likely to entail potential increases in patient risks. The concern with handoffs has resulted in a growing research literature and in attention from organisations such as the British and Australian Medical Associations[1 2] and the WHO.[3]

A leading example of regulatory concern is provided by the Joint Commission in the USA. This body (formerly known as JCAHO) has as its mission to 'improve the safety and quality of care provided to the public through the provision of healthcare accreditation and related services that support performance improvement in healthcare organisations.'[4] By means of its accreditation standards, unannounced surveys of participating institutions, and resulting certifications, it is a major direct force in maintaining and improving healthcare quality in the USA, with indirect influence worldwide by means of the educational, accreditation and certification programmes of the Joint Commission International. It was therefore quite significant when, in 2006, the Joint Commission added to its National Patient Safety Goals Requirement 2E: 'Implement a standardised approach to "hand off" communications, including an opportunity to ask and respond to questions.' This initiative directly affected the vast majority of US hospitals, and at the same time signalled the importance of research investigating how handoffs are accomplished and how they could be improved.

In order to provide guidance to interested hospital policy makers and researchers, we have undertaken a comprehensive review of the published literature dealing with handoffs and related concepts such as 'signout,' 'shift report' and 'handover.' We have searched PubMed and other electronic resources for all English-language medical literature on handoffs by all types of hospital personnel published through July 2008. We have used partial bibliographies compiled by earlier researchers and have also recovered any pertinent publication cited in the search results, leading us to print publications stretching as far back as 1968. We have also included a few select pieces published after July 2008, and a small number of publications that are relevant, but are not directly about handoffs—such as key studies of resident hours limitations. Our collection includes a total of 545 items, and we believe it to be nearly exhaustive. A lengthy document surveying many substantive aspects of this literature that may be of interest to researchers or policy makers is available on the internet. (The URL is http://hdl.handle.net/2027.42/61498. Our point of view in preparing this overview has been that of social scientists interested in how to better understand and improve this important and frequently recurring form of communication about patients. An online bibliography covering much of the material collected is available at http://www.connotea.org/user/signout. Each item is linked to a full text copy maintained by the authors. Under the fair use provisions of the copyright law, legitimate researchers have a right to access such material and may contact either author for permission to use the full text library. Support for this review was provided by an Investigator Award from the Robert Wood Johnson Foundation.)

Here we report four conclusions from our review about major deficiencies of the literature that have significant implications for researchers and for policy makers in healthcare organisations that are attempting to improve handoffs—a large group that includes, but stretches far beyond, those in the UA directly subject to Requirement 2E.[5–7] We have found that important ambiguities remain in the way (1) 'handoff'' and (2) 'standardisation' are

defined, that (3) there is no analysis of how patient safety is to be traded off against many other important functions that handoffs subserve, and that (4) a reliable relationship of handoff interventions to measurable patient safety outcomes is not adequately established.

First, there is little attention in the literature to the careful definition of handoff. While a few publications do offer general definitions, there are no widely cited discussions of what activities the term 'handoff' does or does not include, and why. A consequence of this vagueness of scope is that healthcare organisations seeking to improve handoffs by standardising their procedures confront uncertainty about the range of activities that should be subject to such efforts. This ambiguity is doubly problematic. If the scope defined for handoffs is too broad, many diverse forms of communication about patients may be included, vastly complicating the problem of standardising handoff communication—for example, too broad a notion might also encompass updates to families on patient progress, or simple requests for clarification of orders. If the scope of handoff is too narrow, many safety relevant loci of handoff communication—such as transporter services or ambulance crew delivery at the Emergency Room—might be bypassed.

Our review required a precise definition to guide our search processes and for decisions on which published items should enter our collection. Our solution may not be perfect, but it aligns with the majority of the few careful definitions that have been offered.[2 3 8–15] We provide it here and describe its advantages in the belief that a careful definitional debate will be advantageous in the long run.

Our working definition of handoff has been:

> the exchange between health professionals of information about a patient accompanying either a transfer of control over, or of responsibility for, the patient.

We focus on information because the function of handoffs is to increase the effectiveness of the actions taken by the receiving party. Even in the most minimal cases, patients will normally be identified by being named, listed or pointed to. We include both responsibility and control in light of observations that these can occasionally diverge in actual hospital practice, as when an emergency department moves a patient to the floor, but delays formal processing of the change, leaving the ward personnel with control, in the sense that they could physically respond to the patient's needs, but without formally transferred responsibility.[16]

In accord with this definition, we included in our search procedures several nearly synonymous phrases, such as 'nursing report,' 'signout' and 'handover.' This approach rules out many situations of more generic communication about patients and yet corresponds reasonably well to the transactions and personnel types encompassed by 'handoff' in the vast majority of the collected publications. We did not include discharge reports, since this documentation can be more comprehensive in nature and is often prepared not only for another known responsible party, but also to serve as a starting-point for care by potentially unknown later parties. This choice aligns with scope of handoff suggested by the University HealthSystem Consortium.[14]

The difficulties faced by both researchers and policy makers are well illustrated by the alternate views of the US Joint Commission, which has been the most prominent actor in efforts to define the scope of the handoff concept. The Commission has recently suggested that it does consider discharge reports to be an instance of handoffs.[17 18] Similarly, we did not include reports from consulting or radiological services, since these also do not accompany transfers of responsibility for the patient. Again, the Joint Commission, working from an implicit definition of handoff, suggests that radiology reports should be standardised as handoffs.[19] These two examples illustrate the ambiguities that arise from the literature's lack of consensus on a more precise definition.

The Joint Commission has recently responded to questions[17] by expanding on its views of what a handoff standard should include. For example, it lays particular stress on the opportunity for questions and answers. However, listing the elements of a satisfactory standard does not define its scope of application. For example, not all situations with question opportunities are handoffs and therefore subject to the requirement for a standard or properly included in handoff research. In delimiting the scope of application of Requirement 2E, the Joint Commission has so far defined handoff mainly ostensively, by providing a series of examples. In their statement of the requirement, they say:

> Rationale for NPSG.02.05.01 [Beginning in 2009, under a new Joint Commission numbering system, Requirement 2E has become NPSG.02.05.01.] Health care has numerous types of [patient] handoffs, including, but not limited to, nursing shift changes; physician transfer of complete responsibility for a [patient]; physician transfer of on-call responsibility; acceptance of temporary responsibility for staff leaving the unit for a short time; anaesthesiologist report to postanaesthesia recovery room nurse; nursing and physician hand-off from the emergency department to inpatient units, different hospitals, nursing homes, and home health care; and critical laboratory and radiology results sent to physician offices. The primary objective of a hand-off is to provide accurate information about a [patient]'s care, treatment, and services; current condition; and any recent or anticipated changes. The information communicated during a hand-off must be accurate in order to meet [patient] safety goals.[19]

In our view, the decisive intrinsic feature that distinguishes the handoff from other communication about patients is the transfer of responsibility or control. It is this that establishes one of the central purposes governing handoff content: to convey concisely what the newly responsible party may need to know in the ensuing course of the patient's care. The Joint Commission may be implying this point when it says 'the primary objective' is to support care with information on 'current condition; and any recent or anticipated changes.'

The majority of handoffs that occur during a typical hospitalisation will be followed within a few hours by a more thorough review of the patient's status, such as daily rounds, or a more extensive analysis of the patient record. Handoffs are therefore not usually constructed as a substitute for a complete consideration of the patient's situation. A definition of handoff should separate this communication mode from the more complete reviews such as morning rounds—or, in our view, the discharge report—and from more focused communications such as consultations.

Second, there is little explicit consideration of the meaning of 'standardising' in the context of improving handoffs.

In consequence, healthcare policy makers have little guidance from reported experience about the nature of the required standardising, and few role models to emulate.[20] Only rarely has published literature carefully analysed the extent to which hospital units can or should 'standardise' handoff practices (with several exceptions[21–23] and a recent Joint Commission FAQ[17]).

The term 'standardise' might naturally be taken to mean that all members of the organisation should use the same method of handing off. This is the sense one would give to the term in the context of something like a checklist for central line insertion. We have found no reports of organisations that have achieved this

ideal for handoffs. This interpretation of standardising might improve communication when patients are handed off between units but would impose a single method on the radically different activities that are conducted in a single modern hospital. We infer—and find in informal enquiry—that this disadvantage is keenly felt in most institutions and prohibits standardising in this first sense.[24 25]

Alternatively, 'implement a standardised approach,' to use the language of Requirement 2E, could mean that each subunit of a large system should define its own best procedure for handoff, such as at shift changes by nurses or physicians within a particular department. However, this unit level strategy has the corresponding disadvantage of not addressing miscommunication between subunits. We believe that this structural distinction between what we term 'within unit' and 'between unit' handoffs requires fundamental new thinking about handoff improvement efforts that recognises two quite different classes of issues.

The most thoughtful work so far has attacked the problem at this single subunit level, developing practical methods to improve handoffs within such areas as an internal medicine service, a psychiatric unit or an emergency department,[24 26] or providing criteria that help single units develop curricula.[10 27]

Where there have been efforts to achieve standard methods between several different parts of an institution, the most common approaches have taken one of two forms: either using a computer-based report in combination with locally differentiated communication practices or using a high-order governing mnemonic to determine the gross structure of the handoff communication. Often, these standard protocol schemes are borrowed from other high-reliability endeavours such as controlling air traffic or nuclear power plants. However, safety experts in those fields have expressed some doubts about the appropriateness of the borrowing.[22]

An example of a mnemonic standard protocol would be the SBAR approach to handoffs, or one of its many variants.[28 29] In this often-recommended approach, a handoff should communicate the Situation, an Assessment, the pertinent Background and a Recommendation for action. This requires each implementing unit to consider how these generic features should be locally instantiated.[15 30–37] The former approach, via computerised reports, also allows for local adaptations either of supplementary documents or of conversations, or via unit-level report customisation.[10 38–42]

The status of the debate over the appropriate scope of standardisation is indicated by recent remarks of Joint Commission officials and surveyors that indicate a willingness to accept a patchwork of subunit standards as meeting the intent of Requirement 2E.[13 43] A 2008 FAQ says, 'Ideally the handoff process would be similar throughout the organisation, but practically the hand-off process may differ from one setting or function to another but not from unit to unit when the unit functions are essentially the same.'[17] In particular, the Joint Commission has favourably mentioned SBAR as an example solution,[3 15 44] as has the Australian National Clinical Handover initiative.[45] However, there is very little published evidence linking SBAR with a reduction in adverse events (with one exception[28]).

The approach of standardising in each subunit—or each distinct 'function'—seems organisationally plausible on the face of it, but we have found no studies that investigate the comparative rate of significant communication errors in handoffs within and between subunits. As modern hospitals have become increasingly complex combinations of specialised units, the difficulty and frequency of between-unit handoffs have clearly increased.[27] It therefore remains possible that many—or even most—of the severe risks to patient safety could be found in between-unit handoffs. These are not directly addressed and could actually be exacerbated when standardisation is developed unit by unit. Evidence from studies of critical incident reports and malpractice cases indicates that between-unit handoffs may be especially prone to consequential breakdowns.[46–48] A recent survey by Horwitz *et al* found that 30% of ED physicians and internists had experienced an adverse event or near-miss as a result of handoff problems.[16]

Third, our review found extensive indications that handoff communications serve many functions besides transmitting information needed for patient safety but found little analysis of the trade-offs among these functions.

There are reports of handoffs playing a significant role in the continuing training of nurses and physicians,[49–54] in transmitting information about the competence of various hospital services and personnel[21 55–57] and in the emotional support that healthcare professionals require in work with such profound human consequences.[49 58–63] However, the literature offers no systematic insight into how these additional goals are to be traded off against the goal of maximising patient safety.[64] For example, if standardising the location of nursing handoff at the bedside might improve awareness of key patient data, how is that to be balanced against possible losses of frankness in discussing delays or near-misses in the patient's treatment that might contribute to long-run process improvement?

As a consequence, those who must develop and maintain standard handoff procedures confront one-sided pressures that may lead to undermining 'extraneous' activities that could be of long run value to the participants, to the institution and to patients other than that being handed off. Optimising handoffs for patient safety, narrowly construed, could have serious institutional side effects, and this issue has not been systematically investigated.[22]

Fourth, we do not have a reliable body of direct evidence that handoff standardisation produces marked gains in measured patient outcomes, such as reduction of falls, length of stay, or preventable adverse events.

Without a robust body of positive results, it may be difficult (and, as Auerbach and colleagues have recently argued,[65] may even be hazardous) to implement widespread changes in practices in the hope of improving quality or patient safety.

The closest approximation to such evidence is a study by Petersen and colleagues.[39] It showed that an earlier-observed[66] significant differential between cross-coverage and non-cross-coverage conditions in rates of potentially preventable adverse events was no longer significant after the introduction of an electronic signout system. The studies are admirable in scope and care. But they do not—and do not claim to—directly demonstrate that standardised computer signout per se fully explains the observed change. As the authors note, (1) their studies were of cross-coverage or its absence, not directly of handoff, and (2) during the nearly 2-year interval between the baseline observation of a relation between cross-coverage and preventable adverse events and its subsequent reduction, a new information system was deployed. However, many unmeasured changes were also occurring in the hospital over that time, and measurements in the intermediate period showed that adverse event rates were falling dramatically before the new signout system was introduced. While the results are suggestive, the authors themselves see the need for additional evidence and say 'The data are not entirely conclusive.'

These two studies by Petersen and colleagues are widely cited in the literature we reviewed. (A citation network analysis by Jeremy Canfield, Joshua Steverman, and Jordan Washburn found them to be the first and fifth most cited papers in our entire corpus (J Canfield, J Steverman, J Washburn, unpublished report, 2008).) They provide the best indication available that handoffs engender preventable adverse events that could be reduced. However, their implications are, as noted, indirect. We found one report that mentions in passing a decline in adverse events measured by small samples of patient files during an SBAR diffusion.[28] There are reports that serious problems often followed poor handoffs,[16 67–72] and there are suggestive studies in non-handoff settings.[73 74] However, we lack strong evidence-based directly on handoff standardisation and patient outcome measures.

As Berwick has recently pointed out in responding to Auerbach *et al*, this kind of data can be especially hard to obtain for safety and quality interventions that are essentially changes in complex social practices.[75] Yet this is the type of evidence that could best be used to motivate healthcare professionals to make changes to their handoff processes. In some other patient safety domains, such as handwashing, or checklists for central line insertions, there is such evidence. Even then, changes in established practices have proven very difficult to implement and sustain.[76 77]

Other studies have used questionnaire items and other intermediate indicators that might be predictive of patient safety outcomes. These have shown some positive effects from handoff interventions.[24 26 29 40 44 78–90] Such results are definitely encouraging for further research and experimentation, but, for now, patient safety advocates cannot point to a substantial and consistent body of solid evidence that might compel professionals to change handoff practices that are habitual at the individual level and deeply embedded as well in local organisational culture.

Overall, our review found that on four key issues, the published handoff literature does not yet provide clear guidance to researchers and practitioners seeking to improve hospital handoffs. It is not fully clear (1) what counts as a handoff, (2) how the idea of standardisation is to be interpreted, (3) how other functions beyond patient safety can be traded off in handoff improvements, and (4) what magnitude of patient safety gains can reliably be expected from handoff improvement. The literature does, however, offer many observations and insights that suggest that improving handoffs may increase patient safety, and that can motivate and guide continuing experimentation by those seeking to do so. And it does suggest much about the further research that needs to be done.

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