

**Factors Impacting the Implementation, Transfer and Retention of Patient  
Safety Best Practices in North American Acute Care Hospitals:  
Assessing Organizational Readiness for Practice Change**

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## Executive Summary

We examine the concept of *organizational readiness* for practice change in patient safety.

Organizational readiness for change refers to an organization's capacity to manage change. We elaborate the concept of organizational readiness through a literature review that covers research in change management, organizational learning and knowledge transfer, innovation diffusion and adoption, and the uptake of evidence-based practice.

Our review of the literature is augmented by the experiences of senior managers -- related to us in structured interviews and summarized here -- in several leading health care systems that have spearheaded progressive patient safety change initiatives. These interviews served as a means of ensuring the relevance of the factors that emerged in our literature review as salient to the success of initiating complex, radical practice change initiatives intended to improve patient safety in hospital organizations and systems.

Factors that are critical to the success of initiating radical patient safety practice change reside at several levels including structure, strategic leadership, and culture. Additional critical change components include strategic prioritization, communication, knowledge and experience with change, and resources.

Based on our literature review and synthesis of qualitative data, we introduce a draft tool, not as yet validated, which is designed to assess organizational readiness for patient safety practice change in hospital systems. The tool could assist in identifying areas in need of action prior to introducing change; repeated administration of the tool could serve to gauge progress in preparing for patient safety practice change.

## Introduction

The release of the Institute of Medicine Report, *To Err is Human*, in November 1999 (Kohn et al. 1999) created considerable pressure on healthcare organizations to identify and reduce adverse events in patient care. Some have identified this report as frame breaking and “galvanizing a dramatically expanded level of conversation and concern about patient injuries in health care both in the United States and abroad” (Leape and Berwick 2005; Wachter 2004). Based on prior epidemiological studies, authors of the IOM Report estimated that between 44,000 and 98,000 Americans die in hospitals each year as a result of healthcare errors. While not all of these errors are preventable, many could be avoided through better professional practices, more effective teamwork, and new technology.

Regulatory agencies and other organizations in the U.S. have been quick to respond to the gap between current practices and new approaches that would improve patient safety over the past several years. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has updated accreditation requirements, emphasizing organizational responsibilities and setting patient safety-related accreditation standards specifically for medication use, infection control, surgery and anesthesia, transfusions, restraint and seclusion, staffing and staff competence, fire safety, medical equipment, emergency management and security.

Since 2003, additional JCAHO patient safety standards have gone into effect for hospitals. These standards address a number of significant patient safety issues, including the responsibility of organization leadership to create a culture of safety; the implementation of patient safety programs; the response to adverse events when they occur; the prevention of accidental harm through the prospective analysis and re-design of vulnerable patient systems (e.g. the ordering, preparation and dispensing of medications); and the hospital's responsibility to tell a patient about the outcomes of the care provided to the patient—whether good or bad.

JCAHO standards and the related patient safety initiatives of other organizations including The Leapfrog Group and the Agency for Healthcare Research and Quality (AHRQ) have contributed enormously to the patient safety movement and to the growing literature on patient safety that identifies various organizational practices that are believed to reduce errors. However, while these patient safety policies and practices are based on well-established research evidence or expert consensus, few are widely adopted, and implementation experiences are highly variable across health care organizations.

Research in the area of organizational behavior suggests that organizations vary in their readiness to undertake change, and that this variability can contribute to explaining some of the differences in implementation experiences.

*Organizational readiness* for change refers to an organization's capacity to manage change, and is determined by gauging the extent to which key factors critical to facilitating change are present or absent in an organization. In their review of innovation diffusion in service organizations, Greenhalgh et al. (2004:607) describe organizations that are receptive to change – or ready -- as those that have capacity to absorb new knowledge, “include strong leadership”, articulate a “clear strategic vision”, have “good management relations”, have “visionary staff in pivotal positions”, enjoy a “climate conducive to experimentation and risk taking”, and have “effective data capture systems”. They state that while “an organization may be amenable to innovation in general [it may not be] ready or willing to assimilate a particular innovation” (Greenhalgh et al. 2004:607), suggesting that having a context that is receptive to change is distinct from being in a state of organizational readiness for change.

While the specific factors that contribute to readiness vary, according to the type of organization and the nature and scale of the change, tools that assess organizational readiness for change are invariably composed of checklists that facilitate an increased understanding of the dynamics of organizational change esoteric to the focal organization (Parker 1997). Typically, these assessment tools document or map the interrelationships between aspects of an organization's design including the organization's operating environment, organizational structure, organizational culture, management practices/style, the role of leadership, organizational strategy, and motivations or pressures for change including performance (Colton 2004; Lehman et al. 2002; Trahant and Burke 1996).

In this paper, we summarize the findings of a literature review we completed that elaborates the concept of *organizational readiness* for change. While organizational readiness has been examined in a variety of industries, our focus is on describing organizational readiness of hospitals for practice change in patient safety. We elected therefore to supplement our literature review with a modest series of expert interviews of senior managers in hospital systems who have been involved in initiating radical practice change related to patient safety. Beyond beginning to identify the key components of organizational readiness for patient safety change initiatives through our literature review and interviews, the interviews led us to identify a number of key success factors for complex, radical practice change initiatives intended to improve patient safety in hospitals:

- Motivate the **need for change**
- Capitalize on any prior or created **momentum for change** through communication and reporting

- Acquire tools and expertise that permit you to **analyze key causal factors** of medical errors
- Recognize the importance of visible senior **leadership** in promulgating change,
- **Strategically prioritize** the need for change,
- develop **measures**, collect data and **report** on these measures, and **evaluate** performance
- Leverage **culture** to reinforce desired behaviors,
- Develop a **structured language** and **protocols** for exchanging information,
- Identify and **remove structural barriers** to change,
- Capitalize on momentum, or **prior knowledge** and experience with change,
- **Dedicate resources** specifically to change initiatives,
- Avail staff of **real tools** to use at the bedside that facilitate the desired behavior and practice change
- Engage **human resource** function in revising policies to reflect desired new behaviors
- Develop a **strategy** for implementing radical change that capitalizes on the self-organizing nature of complex adaptive systems

## Methods

The assessment tool is based on an extensive literature review and a modest series of structure interviews.

To complete the literature review, we searched the following databases: MEDLINE, CINAHL, ACP Journal Club, EMBASE, HealthSTAR, PubMed, Cochrane Library, and Wilson Business Index for articles published in the interval 2000-present using the following keywords: organizational (or) system readiness for innovation; innovation adoption; diffusion of innovations; organizational innovation; readiness for change; capacity for change; change capacity; learning capacity; learning organizations; absorptive capacity; patient safety practice change; practice change; adoption of best practices; implementation of best practices; implementing practice change; safety management; error reduction; and medical errors. The articles we accessed were then grouped into four categories: (1) Readiness to Change/Organizational Change, (2) Evidence-Based Practice/Guideline Implementation, (3) Organizational Learning and (4) Adoption/Implementation of Innovations. Our review suggested to us eight key themes that are relevant to gauging and ensuring readiness for radical change: Leadership, Communication, Structure, Culture, Resources, Monitoring & Reporting, and Process. We discuss these in detail in the section that follows.

We augmented our literature review with structured interviews with three senior managers in three leading health care systems that have spearheaded progressive patient safety change initiatives. These interviews served as a means of ensuring the relevance of the factors that emerged in our literature review as salient to the success of initiating complex, radical practice change initiatives intended to improve patient safety in hospital organizations and systems. The interviews also afforded us rich data by which to elaborate on each of the factors, and in some instances were suggestive of ways in which to express or operationalize them in our assessment tool. Finally, the interviewees shared some of their innovative change ideas and strategies which we highlight in a section that follows.

## **Conceptualizing & Operationalizing Organizational Readiness**

### *A Summary of Our Literature Review & Structured Interviews*

Research and theory originating in four distinct fields are relevant to conceptualizing organizational readiness for patient safety practice change in hospitals: change management, organizational learning and knowledge transfer, innovation diffusion and adoption, and the evidence-based practice (EBP) literature. Seven key themes emerged consistently across the papers we reviewed as relevant to determining overall organizational readiness for radical change: Leadership, Communication, Structure, Culture, Resources, Evaluation, and Process.

**Leadership.** Leadership is key to driving and sustaining radical change (Nemeth 2003). Frequently leaders act as change agents or catalysts for change, or they identify the individuals who can. Greenhalgh et al. (2004) suggest six “elements of system readiness” that move organizations from being receptive contexts for change to being change-ready: tension for change, innovation-system fit, assessment of implications, support and advocacy, dedicated time and resources, and capacity to evaluate the innovation. These elements indeed emerged in our literature review and through our interviews; putting these elements in place, we suggest, falls within the purview of those in leadership roles.

Four sub-themes emerge from our literature review with respect to leadership, each reinforced through our interviews with senior managers engaged in radical change initiatives. The first sub-theme relates to the importance of observable leader behavior in motivating and communicating the need for change, ranging from the executive to clinical leaders. The importance of leadership in “walking the talk” during times of change is a familiar theme with roots in Chandler’s observations on twentieth century revolutionary leaders (Chandler 1962). In a recent systematic review of literature on innovation in service organizations,

Greenhalgh et al. (2003:607) discuss the importance that emerges from the literature of having “visionary staff in pivotal positions” to contributing to an organizational context receptive to change. In their examination of the process of adoption of the Hospital Elder Life Program (HELP), Bradley et al. (2004) found that the demonstrated commitment of credible clinical leaders (physicians and nurses) was key to maintaining the momentum for change. HELP is an evidence-based multi-faceted innovation that demands high investment in human capital and extensive cross-discipline coordination, hence clinical leaders served vital roles in the coordination of staff across disciplines, in addition to championing change among fellow clinicians. Further, clinical leaders with strong ties to hospital administrators were very effective in promoting HELP and in procuring start-up funding. The importance of ensuring the presence of effective clinical leadership was underscored in our structured interviews; one interviewee attributed the success of change initiatives in his organization to “visible clinical leadership” and “visible senior leadership”. Another individual we interviewed described a retrospective strategy around leadership engagement which involved the recruitment of middle management champions identified by senior management to participate in a patient safety practice change pilot initiative. These people were described as “identifiable future leaders” who were involved in every aspect of the pilot from inception to reporting, and who were critical to demonstrating the new, desired behaviors to pilot site staff and encouraging behavioral change of them. These middle managers were so effective as champions that some went on to lead the same initiative as other sites in the system, while all are recognized as “internal champions” to efforts to roll out the initiative to other sites beyond the original pilot hospital. Bradley et al. (2004:1878) describes two strategies for securing effective clinical leadership that we suggest are the responsibility of senior leaders: “identifying clinical leader(s) with credibility within hospital, high personal commitment to program, linkages to organization’s administrative structure, and knowledgeable about the organizational culture” and “retain clinical leaders through adequate funding of their time and budget flexibility to invest needed resources during implementation” (resource adequacy is discussed in the section entitled Resources, below). This discussion led us to develop the following items for inclusion in the Leadership component of the assessment checklist:

- ▶ Senior leadership has identified clinical leaders who have organizational credibility, linkages with administrators and other clinicians, and are familiar with the organization’s culture.
  
- ▶ Credible clinical leaders are engaged with senior leadership in discussions relating to the patient safety practice change initiative from inception.

- ▶ Credible clinical leaders communicate (verbally and/or in writing) their commitment to the patient safety practice change initiative to other clinicians and staff.
- ▶ Credible clinical leaders demonstrate their understanding and commitment to the patient safety change initiative by enacting changed behaviors, and through offering consultation to their peers and colleagues.
- ▶ Clinical leaders are retained by senior leadership with adequate support including funding for time in implementation and for investment in resources needed for implementation.
- ▶ Clinical leaders are recognized publicly for their commitment to the patient safety practice change initiative through incentive programs including corporate recognition programs.
- ▶ The job of clinical leaders are revised to reflect new behaviors, routines, and care practices.

Literature on knowledge transfer suggests that there are important informal leadership roles that can perpetuate adherence to new practices in health care organizations. In a recent systematic review, the use of *opinion leaders* was shown to be moderately effective for guideline implementation in long-term care settings (Davis & Taylor-Vaisey 1997). Studies in long-term care facilities have shown positive impacts on quality of care associated with having gerontological nurse specialists in opinion leadership and supportive direct care roles such that they can lead by example when new care practices are introduced (Kane, 1988; Mezey and Lynaugh, 1991; Gerrish, 1999). Kitson and colleagues (1998) have proposed a conceptual framework to explain the uptake of evidence into practice as a function of the relation between evidence, context, and facilitation.

*Facilitation* is effected by a human change agent who fulfills a supportive role, offering skills that is matched to the particular needs of the staff and practice environment in which evidence-based practice is being fostered (Harvey, 2002). Support needed may vary from task-oriented practical-technical help on an episodic basis to a sustained holistic-enabling form of help at different stages of implementing practice change.

- ▶ Opinion leaders and facilitators are available to demonstrate and advise staff on new behaviors required as part of the patient safety practice change initiative.

The second sub-theme relates to the need for leadership to articulate the operational implications of an impending change to staff in clear, understandable terms. Often this involves modeling complex behaviors that illustrate or exemplify the behavior changes that will be required of staff. Some researchers



identify this as one of the most critical features of change initiatives. In her article on change and complexity theory, Nemeth (2003:136) describes this need in terms of an obligation on the part of senior leadership to their management and staff: “leaders need to be in place to guide the process of implementing change, and they need to be aware of the potential obstacles or barriers that may work against the change being implemented”.

One key obstacle to change identified in the innovation literature is organizational resistance to adoption. Rogers (1995) argues that an innovation with the attributes of relative advantage, compatibility, complexity, and observability will be adopted more quickly than one that does not possess these characteristics. *Relative advantage* relates to the extent to which the innovation is thought to be superior to what it is replacing. Gustafson et al. (2003:755) discusses the positive impact on the likelihood of implementation success of “demonstrable benefits and valued consequences of a proposed change”. *Compatibility* refers to congruence of the innovation or knowledge with individuals’ experience, values and beliefs. Compatibility is not always immediately apparent: one interviewee described the importance of reminding staff of their prior experience, and success, in patient safety initiatives in anticipation of a more ambitious change initiative. *Observability* and *complexity* are related in that complexity can be reduced through providing opportunities to staff to observe others “in action” as they implement the new idea, routines or practices (Rogers, 1995). Grilli and Lomas (1994) used Rogers’ attributes of innovations to characterize a series of practice guidelines that had been published in the literature along with rates of compliance with the guideline by physicians. They found that guidelines that were deemed to be highly complex had lower compliance rates, while observability was not found to be significantly related to compliance.

Resistance to change can be overcome through approaches that involve discussion, demonstration and communication led by organizational leaders (Kotter and Schlesinger 1979). Modeling change is a strategy shown to be successful in decreasing resistance to complex change, and in facilitating the transfer of new knowledge and routines that are reliant on tacit knowledge. Expectations of behavioral change need to be communicated formally, demonstrated to those who are expected to change, supported with the concurrent availability of bedside tools (e.g., job aids, flow charts), and reinforced both informally through leadership communication and formally through revised performance reporting structures. One of our interviewees described his organization’s successful, multi-pronged patient safety initiative that was predicated on creating safe behaviors in key areas through meeting “behavior based expectations” or BBEs. BBEs arose in part because the organization’s original policies and procedures around care delivery and patient safety practices were impenetrable and so were generally poorly understood and

implemented among staff. With respect to patient safety, there was a tendency in the organization to rely on admonitions to “be safer” without any clear communication around that behaviors that might contribute to safer patient care. Clinical leadership recognized that a key component of their organization’s patient safety initiative was an investment in making policies and procedures accessible and understandable, and making them tractable and easy to operationalize. BBEs were developed through a consultative process with clinicians and staff. When BBEs were formally introduced, bedside tools (e.g., flow charts, care aids) were also put in place that offered tangible illustrations of the BBEs at point of care. Training, demonstrations and other change modeling took place on the use of the bedside tools. Further, an observational methodology was introduced which involved the reinforcement of BBEs through manager “walk arounds”. The following checklist items are suggested to us by this discussion:

- ▶ The relative advantage of the patient safety practice change initiative is known and communicated as demonstrable benefits and valued consequences (verbally and/or in writing).
- ▶ Expectations of behavioral change related to the patient safety practice change initiative are communicated formally (verbally and/or in writing).
- ▶ Expectations of behavioral change related to the patient safety practice change initiative are demonstrated and/or modeled to those who are expected to change.
- ▶ Expectations of behavioral change related to the patient safety practice change initiative are supported with the concurrent availability of bedside tools.
- ▶ Expectations of behavioral change related to the patient safety practice change initiative are reinforced both informally through leadership communication and formally through revised performance reporting structures.

The third sub-theme relates to the need on the part of leadership to communicate their commitment to change by formally prioritizing specific change initiatives. The change management literature consistently underscores the link between the formulation and broadcast of distinct higher-level/strategic objectives around major change and the likelihood of its successful implementation (Quinn and Cameron 1989; Senge 1990). Publicly articulating strategic objectives relating to radical change signals intent and commitment on the part of senior leadership, and attracts the attention of staff and stakeholders. One senior manager that we interviewed described a process undertaken by senior leaders in his hospital system involving the public, concerted “de-prioritization of other strategic initiatives” -- some of them extremely important

to his organization historically -- through restatements in corporate strategic planning documents and communication broadcasts that inserted a system-wide safety initiative as the new top priority.

In their review of innovation diffusion in service organizations, Greenhalgh et al. (2004) describe the role of leadership in creating a tension for change in their organization, and attending to the fit between an organization's strategies and goals and the change (they refer to innovations) being considered. Gustafson et al. (2003) refer to work that suggests that tension for change is one of the key predictors of success of a change initiative: tension for change arises when staff are dissatisfied with the status quo to the point of finding continuance intolerable. Effective communication begins with senior leadership who increase tension for change through announcements of change and explanations for the need to abandon the status quo, or reasons that justify feelings of dissatisfaction.

- ▶ Senior leadership formally establishes strategic objectives relating to the patient safety practice change initiative.

- ▶ Senior leadership and clinical leadership accompany announcements of the patient safety practice change initiative with explanations for the change, including reasons why the status quo is no longer tolerable.

The fourth sub-theme relates to creating affective commitment to change on the part of employees (Herscovitch and Meyer 2002). Work in organizational behavior that examines individuals' propensity to change suggests that commitment to change is an important predictor of the success of change initiatives (Connor and Patterson 1982). Recently, Herscovitch and Meyer (2002) showed that commitment to *change* is better able to predict the demonstration of on-the-job behavior that is supportive of change than is an employee's level of organizational commitment. Organizational commitment is a conglomerate of *normative commitment*, where employees remain with an organization because they feel obligated to do so, *continuance commitment*, where employees remain in order to avoid the costs of leaving, and *affective commitment*, where employees remain because they want to. Like organizational commitment, commitment to change is a conglomerate construct defined as "a force (mind-set) that binds an individual to a course of action deemed necessary for the successful implementation of a change initiative...that...can reflect (a) a desire to provide support for the change based on a belief in its inherent benefits (affective commitment to change), (b) a recognition that there are costs associated with failure to provide support for the change (continuance commitment to change), and (c) a sense of obligation to provide support for the change (normative commitment to change). That is, employees can feel bound

to support a change because they want to, have to, and/or ought to” (Herscovitch and Meyer 2002: 475).

Engendering commitment to change, therefore, is an important aspect of preparing for organizational change. Employees who are committed to change are more likely to manifest behaviors that support the change than those who lack commitment. Specifically, the work of Herscovitch and Meyer (2002) show that efforts to enhance affective and normative commitment to change contribute most to explaining compliance with behavioral change expected in relation to change initiatives. Affective and normative commitment are related to several important outcomes including “a willingness to work cooperatively with others, to exert extra effort to achieve the objectives of the change, or to serve as a champion of change” (Herscovitch and Meyer 2002:483). Referring to previous research in workplace commitment, these researchers suggest that affective commitment to change is particularly important to engendering openness to change, and a readiness for change, among individuals facing organizational change. Activities that draw individuals into the process of change, and so increase their involvement and appreciation for the value of impending change and associated courses of action will enhance affective commitment to change. Efforts on the part of leadership that compel the need for change, and which are accompanied by the availability of resources and knowledge that facilitate learning about the change and leadership’s changed expectations, will build affective commitment to change (Herscovitch and Meyer 2002). This discussion of research in the area of commitment to change suggests the inclusion of the following items in the assessment for change readiness checklist:

- ▶ Leadership engages staff in discussions of the patient safety practice change initiative, including problem identification, idea generation for solutions, and implementation planning.
- ▶ Leadership makes available to staff resources (e.g., training), opportunities, and knowledge (e.g., reports, consultation) that facilitate learning about the change, the need for change, and changed expectations relating to behavior.

An illustration comes from one of our interviews. One senior manager described the situation where he brought all the clinical leaders from one organization together in a single room with the express purpose of providing a novel forum in which they could share their experiences with medical errors, receive training on common causal analysis techniques, and use these experiences and skills to identify the four most common causal factors which were: problems with communication, inattention to detail when undertaking repetitive tasks, overly complex policies and procedures, and a lack of skills and tools needed to identify when things were going bad. This session served to galvanize change in this

organization; from this point, clinical leaders met routinely to develop, and later implement, solutions to the four key causes of medical errors in their hospital.

**Communication.** Communication under conditions of radical change has a great deal to do with leadership's communication to staff around the need for and implications of change; these are aspects we have addressed above. Here, we discuss communication in the sense of strategically addressing differences in communication among organizational members as a means of contributing to organizational readiness for change. To some extent, a common form of communication is an aspect of organizational readiness for change that is assumed in admonitions to invest in a common definition of the problem(s) and its causes in early stages of undertaking change (Senge 1999). Certainly, consensus problem definition is necessary to arrive at agreement on whether or not a proposed change is the best from among an array of possible solutions. However, in health care and in other organizations that engage multiple disciplines in complex tasks, a common form of communication cannot be assumed. Clinicians are trained differently: they use different language to describe similar phenomena, or are attuned to entirely different phenomena relating to the same patient, describe and solve problems differently, and generally are at risk of not being understood by their colleagues from other disciplines. One interviewee described this situation as feeling as though co-workers, ostensibly working as a team to deliver patient care, were "not all in the same movie".

Across all three interviews we conducted, communication failures were cited as the root cause of patient safety failures. Two of the interviewees described their organization's substantial investments in developing structured communication systems to facilitate discussion of patient safety failures among professional staff. One interviewee spoke passionately and at length about the criticality of resolving upon a *common structured language*, through mechanisms such as SOAP and SBAR, to facilitate a common understanding of the nature and causes of medical errors, and the equally important investment in developing a *critical language* that was universally understood and which when invoked by any clinician or staff member would alert others of error-conducive events or situations.

▶ A common structured language is understood and used by clinicians to describe medical errors and events that contribute to them.

▶ A critical language is used by all hospital staff to alert others of error-conducive events or situations.

**Structure.** Structure in the context of patient safety practice change relates predominantly to structural mechanisms that facilitate inter and intra-

organizational communication about the need for change, the nature of the change, and outcomes related to implementing the change. Theories in organizational learning and knowledge transfer suggest mechanisms to facilitate both types of communication and information transfer.

Research in organizational learning demonstrates that the barriers to knowledge transfer from unit to unit within organizations are often formidable. Szulanski (2000) observes that “even though intra-firm transfers of knowledge are often laborious, time consuming and difficult, current conceptions continue to treat them as costless and instantaneous” and “negate the possibility of difficulty”. In his study of the transfer of best practices within firms operating in diverse industries, Szulanski (1996) demonstrates that the dominant barriers to intra-firm transfer are related to the knowledge being transferred and to the characteristics of the recipient organization. He ascribes situations of “internal stickiness” to a lack of “capacity” for learning within an organization.

Learning capacity is related to the structural capabilities within an organization that promote knowledge transfer across units (Argote 1999) and how well the organization's structure supports the replication processes. Structural capabilities that support intra-organizational transfer and communication include: (1) standardization and documentation of activities, (2) the setting of superordinate goals that demand cross-unit cooperation and depend upon knowledge transfer, (3) providing opportunities to interact and exchange knowledge through meetings and conferences, and (4) rotating personnel to affect the transfer and exchange of new knowledge. The presence of these structural capabilities is indicative to us of organizational readiness to change in complex organizations that are preparing to engage in radical change. Certainly, the first capability around standardization is necessarily preceded by the development of a common structured language for use in documentation.

► Structural capabilities are present that support intra-organizational transfer and communication around the patient safety practice change.

Practice change interventions frequently fail to consider the resources required of the intervention or the need for coordination among organizational members and units when it becomes desirable to replicate the intervention in other parts of the organization (Schnelle, Ouslander & Cruise, 1997). We suggest that the extent to which practice changes are replicated across units in health care organizations is contingent on the availability of adequate human resources, financial resources, and general operating knowledge. Some structural mechanisms facilitate access to resources vital to facilitating communication flow and knowledge transfer around practice change interventions, including committees or task forces charged with leading change, and individuals whose purpose is to share and disseminate information about the intervention. One interviewee

described the critical role that some of the middle managers involved in the initial pilot stages of his organization's patient safety practice change now play as "internal consultants" that are dedicated to leading similar change initiatives in other organizations belonging the health care system. These internal consultants are now supported by three full-time employees who assist in the implementation of patient safety practice change across the health care system, and predicated on the same set of behavior-based expectations.

► Consideration is given to the resources that will be needed to support the patient safety practice change initiative.

► Structural mechanisms are in place to facilitate intra-organizational communication and information flow relating to the patient safety practice change initiative.

**Culture.** *Organizational culture* is "...the combination of the symbols, language, assumptions, and behaviours that overtly manifest an organization's norms and values. It is the taken-for-granted and shared meanings people assign to their social surroundings..." (del Bueno & Vincent 1986:15). In their study, Rich and Oh (2000) found that patterns of acquisition and use of research knowledge by government healthcare policy makers were far better explained as a consequence of the highly 'defensive' bureaucratic culture in which they operated than in relation to the quality or availability of research knowledge relevant to their policy field. Coeling and Simms (1993) describe a process to strengthen the cultural forces on nursing units that encourage innovation and [overcome] forces that constrain change. A vital element in the process they describe is an assessment of the unit culture and the "cultural elements" of the innovation. The cultural elements of an innovation are reflected in the patterns of work, working relationships and common values required for an innovation to be successfully adopted and replicated.

A great deal of work has addressed the role of culture in contributing to patient safety in hospitals. A safety culture is one which is "pro-learning...including such principal characteristics as tolerance of mistakes and avoidance of blame, absence of non-invented here attitudes, a high level of cross functional and interdisciplinary integration..." (Sadler, 2001: 426). Researchers that focus their studies on the cultures of health care organizations suggest that there is a need to move from a "culture of blame that hides information about risk and error into a culture of safety that flushes information out and enables us to prevent or quickly recover from mistakes before they become patient injuries" (Leape 1998: 1447). Safety culture has been identified as important to preventing errors in other high hazard industry including aviation (Gregorich, Helmreich, & Wilhelm, 1990). Measures developed in aviation and the nuclear power industry are now being used to measure aspects of safety culture in healthcare (Ginsburg et al.,

2004; Helmreich & Schaefer, 1994; Sexton, Thomas, & Helmreich, 2000; Singer, Gaba, Geppert et al., 2003). A safety culture is described as a culture that facilitates a “process of collective learning” (Mohr, Abelson, & Barach, 2002), which exists to permit individuals and teams to learn from errors (Firth-Cozens, 2001).

Each of the individuals we interviewed referred to the importance of creating a safety culture to prepare for and facilitate patient safety practice change. One interviewee referred to his organization’s work, and his personal mission, to create a culture of psychological safety where “it is safe to raise your hand”. Another interviewee, describing a more recent system-wide change initiative, referred to a cultural assessment (specifically that developed by the AHRQ) as the first step in initiating patient safety practice change at any given member site in his health care system. He described setting leading measures based on an organization’s culture index as one of three key success factors in patient safety practice change initiatives he has led.

- ▶ A cultural assessment is completed in the pre-implementation stages of the patient safety practice change initiative.
- ▶ Culture is employed as a means of reinforcing desired safe behaviors.
- ▶ Goals around achieving a safety culture are established as part of the patient safety practice change initiative.

**Resources.** Bradley et al. (2004:1878) describes the importance of retaining effective clinical leadership with adequate resources that include funding, time and budget flexibility to permit ad hoc investments in additional resources during implementation. The importance of resource adequacy is discussed in the innovation literature: Gustafson et al. (2003) show that a sustained level of adequate funding is a significant predictor of success of health care improvement projects. Rogers (1995) discusses the role of funding and other resources vital to the uptake and assimilation of innovations in organizations. The importance of adequate resources was reinforced in one of our interviews where the interviewee described some leaders as among the most resistant to changing their behavior, yet also among the most important targets for behavior change if a change initiative is to be successful. He described his organization’s efforts to overcome leadership resistance through enhancing incentives for behavioral change including expanded corporate recognition programs, and engaging their human resources function to revisit formal reward systems and hard-wire the behaviors into job descriptions.

- ▶ Incentives for clinical leadership are in place to encourage and sustain behavior change related to the patient safety practice change initiative.



**Monitoring & Reporting.** The importance of goal setting, monitoring and reporting around change initiatives is highlighted as a key factor in the change management literature, and emerged in each of the interviews we conducted. Change management theorists describe goal setting and the monitoring and reporting of progress as a critical, but often overlooked, factor that sustains change (Senge 1999).

One interviewee spoke compellingly about the three “key success factors” for patient safety practice change in his organization, the first of which is setting goals and measuring against them. He prefaced his points around change by referring to them as lessons learned, based on his early experiences with a pilot change initiative. Now, he says, goals and measures are developed at the beginning of each site-specific patient safety change initiative and mechanisms for sharing data and progress reporting are established at the onset of implementation. He describes three types of measures: 1) leading measures based on the culture index of the organization, 2) real-time measures that rely on an observational methodology and adherence to a “5 P’s of Hand Off” rubric, and 3) lagging measures that include risk audits, events rates, malpractice claims, and quality and safety dashboards. On a system level, the patient safety improvement initiative has been ongoing for several years; in recent years, leadership has revisited goal setting and evolved the process which now involves establishing integrated goals for patient safety that include considerations of risk management, safety and quality. Monthly clinical quality and safety meetings involving clinical leaders are held in which the progress of the patient safety initiative is reviewed against site-specific goals.

- ▶ Goals are set regarding the patient safety practice change initiative, and measures are established against these goals.
- ▶ Mechanisms are put in place in which progress against the goals are reviewed, reported, and can serve as the basis for further action.

**Strategy for Change.** Recent insights from complexity science suggest a strategy for change suited to initiatives undertaken in complex systems like health care (Nemeth 2003; Suchman 2001). Complexity theory (Zimmerman et al. 1998) suggests that the self-organizing nature of complex adaptive systems, including those that are socially constructed, allows for the emergence of optimal change solutions from among those that are trialed. Suchman (2001: 345) proposes a strategy for change that reflects these concepts and encourages the emergent process: “articulating a common purpose and aims; promulgating a new set of simple rules to guide the interactions and behavior of the participants; developing new enabling tools (notably an information infrastructure and evidence-based practice guidelines); and establishing a facilitating environment

(particularly with regard to financing, regulation and professional recruitment and education)". In the EBP literature, fairly prescriptive step-by-step models for research-based practice change are suggested have been recently supplanted by planned change models (e.g., Rosswurm and Larrabee 1999) that offer guides to implementing practice change and otherwise accommodate the emergence of solutions. Thurston and King (2004:241) studying the implementation of a mentorship program for hospital and community nurses in British Columbia that included an EBP initiative, describe a successful, phasic planned change model that was predicated on the original Rosswurm and Larrabee model: "[1] assess need for change by collecting and comparing data, identifying practice problem, [2] link problem to interventions and outcomes using standard classification systems and languages, [3] synthesize best evidence by search research literature, critiquing, rating and synthesizing best evidence, assessing feasibility, [4] design practice changes by defining protocol change, planning a pilot/demonstration including implementation, education, resources needed, [5] implement and evaluate the practice change including evaluation of pilot and decision to adapt/adopt/reject change, [6] integrate and maintain change by communicating to stakeholders, in-service education, approving practice standards and monitoring outcomes".

► A strategy for change is developed that allows for the emergence of optimal change solutions from among those that are trialed.

One interviewee described his organization's approach to planned change which has emerged through early change experiences. The entire system's change strategy arose from the experiences of a pilot that took place at one hospital. As a consequence of those early pilot experiences, the system-wide change strategy incorporate the following basic elements: (1) an initial assessment that includes a cultural assessment, review of sentinel events, and a review of the organizations structure all of which contribute to identifying key factors causing medical errors, (2) orientation and training on common techniques for causal analysis including root cause analysis, (3) identification of organizational capabilities that can be improved, (4) orientation to the behavior based expectations (BBEs) of the patient safety initiative, (5) establishing achievable goals that integrate risk management, safety and quality, (6) reinforcement of the BBEs through an observational methodology that includes management walk arounds, and (7) establishment of monthly progress report meetings.

## **Existing Instruments to Assess Organizational Readiness**

Simpson (2002:176) describes organizational-level assessments as "perhaps the most challenging because they require data to be taken from individuals within an organization (e.g., leaders, staff, patients) and then aggregated in ways that

represent “the organization”. Selection of appropriate scales, data collection format, reliability and validity of measures, selection or sampling of individuals to properly represent the organization, and methodological alternatives for aggregating data are issues that must be addressed”. In this section, we describe two instruments that exist for assessing organizational readiness for change whose development has been rigorous; these include the Texas Christian University (TCU) *Organizational Readiness for Change (ORC)*, and David Coulton's *Checklist for Assessing Your Organization's Readiness for Reducing Seclusion and Restraint*. Both instruments are included in Appendix 3.

Texas Christian University's ORC is an instrument designed to help identify organizational traits that predict technology transfer outcomes related to the introduction of substance abuse treatment programs. The ORC consists of 115 Likert-type items that measure 18 domains relating to four readiness factors: motivation for change, adequacy of resources, staff attributes and organizational climate. While the instrument is still being refined, its development has been rigorous. In addition to the ORC itself, a paper describing recent work to establish the ORC's construct validity is included in the appendix to this paper (Lehman et al. 2002). Three versions of the instrument are available for administration to leaders, staff and patients of organizations preparing for technology change. The ORC is presented by its developers as a tool for assessing the impact of interventions introduced to raise motivation for change; as a tool for assessing the impact of transfer strategies that precede full implementation (e.g., pilots); and as a source of information when it is necessary to analyze the failure of a change initiative.

Coulton's *Checklist for Assessing Your Organization's Readiness for Reducing Seclusion and Restraint* targets organizations providing behavioral/mental health care to children and adolescents and focuses on their use of restrictive interventions. The assessment tool provides a checklist, developed through a rigorous process that included a systematic literature review followed by content analysis and application of a modified Delphi technique involving clinicians, program managers, and educators in the field of behavioral/mental health care in the United States and Canada to pretest the instrument and establish content and construct validity. The instrument has been field tested in five behavioral/mental health care facilities operating in the United States including four state hospitals and one residential treatment program. Field testing has led to minor revisions to the wording of items and response scales, and to the addition and deletion of some items. Instrument items are distributed across nine themes including: leadership, orientation and training, staffing, environmental factors, programmatic structure, timely and responsive treatment planning, processing after the event (debriefing), communication and consumer involvement, and systems evaluation and quality improvement.

## **Assessment Tool**

### *Organizational Readiness for Practice Change in Patient Safety*

As discussed above, a number of instruments have been developed to assess organizational readiness for change. The draft instrument we introduce here (Appendix 4) is distinct from these, focusing on the capacity or readiness that hospitals have to identify, adopt, replicate and sustain patient safety best practices. Like the instruments we refer to above in the literature review section, our tool is in the form of a checklist that attempts to operationalize the key themes that emerged across the literature we reviewed. The checklist is divided into the seven sections we introduced in our discussion above.

The tool is designed for use by patient safety function staff and senior managers engaged in nascent patient safety initiatives who wish to gauge the readiness of their organization for patient safety practice change (refer to Appendix 4 for a draft survey). Not only might the readiness tool permit organizations to gauge their own readiness for patient safety practice change, it might also serve as a means by which CHMR member organizations can benchmark against one another in terms of change capacity/ readiness.

While our structured interviews have contributed to ensuring the content validity of the assessment tool, we suggest that further work be done to address construct and content validity prior to wide-spread application of the tool. An excellent means by which to accomplish this is through the use of a Delphi consensus technique which could engage several individuals with expertise in the areas of change management, practice change and patient safety.

## **Conclusions**

Research across industries has shown that organizations vary in their learning capacity – that is, the rate at which they can identify, import and retain useful knowledge to effect performance improvements. Often the implication of applying new knowledge is change, therefore considerations of learning capacity need to incorporate considerations of organizational capacity to change, or change readiness.

Hospitals in North America face the task of learning how to make patient care safer. It is far from a simple undertaking, despite the availability of policies and practices that are based on well-established research evidence or expert consensus. Regulatory and competitive pressures have focused attention on creating structures and work routines that reduce adverse events. Hospitals are also recognizing the need to embed new knowledge on patient safety practice in

their staff, work routines, information systems and organizational cultures. In response to these pressures, many organizations have initiated radical change initiatives with variable success. Some hospitals and hospital systems, encountering considerable technical and cultural barriers to change, have found it difficult to transfer and implement changes that have been successful in other settings and to create a sustainable momentum for improvements.

Research in other sectors of health care, and in other industries, suggests that a useful pre-cursor to embarking on change is concerted, systematic consideration of change readiness.

Here, we describe the development of an assessment tool for *Organizational Readiness for Practice Change in Patient Safety* from a comprehensive literature review through which we identified eight themes that are relevant to gauging capacity for radical change in patient safety practice. The checklist of actions and factors that comprise the tool operationalizes each of the eight themes. A modest series of expert interviews assisted us in ensuring that the themes were valid to patient safety practice change initiatives, and helped us in their operationalization.

We see the tool as useful in the pre-initiation stages of a practice change initiative, where repeated application will assist change leaders in gauging progress toward change readiness.

The tool we have developed has yet to be field tested. We suggest that further work be done to address construct and content validity prior to wide-spread application of the tool.

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## **APPENDICES**

**Appendix 1. Annotated Bibliography**

**Appendix 2. Structured interview Guide**

**Appendix 3. Existing Organizational Readiness Assessment Tools**

**Appendix 4. Assessment Tool (DRAFT): *Organizational Readiness for Practice Change in Patient Safety***

## Appendix 1. Annotated Bibliography

### 1. Readiness to Change/ Organizational Change

**Bennet, M. (2003). Implementing new clinical guidelines: the manager as agent of change. *Nursing Management*, 10(7):20-23.** This article focuses on change management, specifically the manager's role in implementing new CPGs on sedation in a pediatric intensive care unit setting. The author provides the 10 key stages of the change management process: 1) identify the need for change, 2) establish views of colleagues, 3) literature review, 4) share results and obtain input into draft guidelines 5) provide training and information to implementers, 6) compile draft guidelines, 7) implement draft guidelines, 8) review and amend guidelines, 9) implement amended guidelines, 10) carry out an audit. The roles of a change agent are also discussed.

**Bland, C.J., Starnaman, S., Wersal, L., Moorhead-Rosenberg, L., Zonia, S., Henry, R. (2000). Curricular change in medical schools: how to succeed. *Academic Medicine*, 75(6)575-594.** This study systematically searched and synthesized the literature on educational curricular change, as well as organizational change to provide guidance for those who direct curricular change initiatives in medical schools. A consistent set of characteristics emerged as being associated with successful curricular change: an organization's mission and goals, politics (internal networking, resource allocation, relationship with the external environment), organizational structure, need for change, scope and complexity of the innovation, cooperative climate, participation by the organization's members, communication, human resource development (training, incorporating new members, reward structure), evaluation, performance dip, and leadership. Each of these characteristics are discussed in detail and related specifically to curricular change in medical school settings.

**Bradly, E.H., Schlesinger, M., Webster, T.R., Baker, D., Inouye, S.K. (2004). Translating research into clinical practice: making change happen. *JAGS*, 52:1875-1882.** This article describes a qualitative study of the process of adoption of a Hospital Elder Life Program into the hospital setting, with particular emphasis on issues that promoted or impeded its implementation. Six common challenges faced hospital staff: 1) internal support, 2) clinician leadership, 3) integration with existing programs, 4) balancing program fidelity with hospital-setting circumstances, 5) documenting positive outcomes of the program despite limited resources, and 6) maintaining the momentum of implementation. Strategies perceived to be successful in addressing each challenge are described

**Colton, D. (2004). Checklist for assessing your organization's readiness for reducing seclusion and restraint. Commonwealth Center for**

**Children and Adolescents. Staunton: Virginia.** This document includes a checklist to provide behavioral healthcare organizations with a systematic approach for identifying factors that influence the reduction of seclusion and restraint and for assessing the level of progress the organization is making toward implementing/addressing each of these factors. Nine thematic areas of the assessment tool are discussed: 1) leadership, 2) orientation & training, 3) staffing, 4) environmental factors, 5) programmatic structure, 6) timely and responsive treatment planning, 7) processing after the event (debriefing), 8) communication and consumer involvement, 9) systems evaluation and quality improvement. Information on scoring guidelines, tool administration, analysis and usage, and cultural change is also provided.

**Dana, B., (2004). Continuous quality improvement readiness assessment process and tool. American Health Care Association/ National Center for Assisted Living.** This document includes a climate survey for measuring the perceptions of employees in areas that are fundamental to the success of implementing the concepts of CQI. Guidelines for reporting and analyzing the survey data is provided. Finally, background on the process and literature used to develop the tool is included.

**Harrison, D., Legendre, C. (2003). Technological innovations, organizational change and workplace accident prevention. Safety Science. 41:319-338.** This article discusses a case study involving seven industrial firms, the objective of which was to generate new hypotheses about the relationship between the way technological change is managed and the organizational transformations that lead to more workers' participation, the occurrence of occupational accidents and illnesses. The changes contribute to improving working conditions, but at the same time, the intensity of work and the increasing of workload mitigate the results, causing ambiguity in the findings.

**Herscovitch, L., Meyer, J.P. (2002). Commitment to organizational change: extension of a three-component model. Journal of Applied Psychology. 87(3):474-487.** This paper presents the findings of a study to evaluate a multi-dimensional conceptualization of commitment to change and examines the relationship between different forms of commitment and employee's behavioral support for change initiatives. The three component model distinguishes between three types of commitment: affective, continuance, and normative, which together form an employee's commitment profile. The study found support for the validity of the three Commitment to Change Scales. It also found: a) commitment to change is a better predictor than behavioral support for a change than is organizational commitment, b) affective and normative commitment to change are associated with higher levels of support than is continuance commitment, and c) the components of commitment

combine to predict behavior. This research has implications for change management – that not all forms of employee commitment to change are equal.

**Horwath, J., Morrison, T. (2000). Identifying and implementing pathways for organizational change – using the Framework for the Assessment of Children in Need and their Families as a case example. *Child and Family Social Work*, 5:245-254.** This article describes approaches to the effective introduction of the framework within social services department and other child welfare organizations through the implementation of an adapted model of change (Figure 1), based on the Prochaska and DiClementi (1982) change model. This model includes six possible stages of a change process: 1) pre-contemplation, 2) contemplation, 3) determination, 4) action, 5) maintenance, 6) lapse or relapse. A model is also provided to highlight the dimensions along which to assess the organization's readiness to implement change (Figure 2).

**Jones, R.A., Jimmieson, N.L., Griffiths, A. (2005). The impact of organizational culture and reshaping capabilities on change implementation success: the mediating role of readiness for change. *Journal of Management Studies*. 42(2):361-386.** This paper describes a study of 67 employees working in a state government department who were about to undergo the implementation of a new end-user computing system in their workplace. The hypothesis guiding this study that employee's perceptions of an organizational culture strong in human relations values and open systems and values would be associated with heightened levels of readiness for change which, in turn, would be predictive of change implementation success. Evidence was found to suggest that employees who perceived strong human relations reported high levels of readiness for change, and that this predicted system usage. Readiness for change was also found to mediate the relationship between reshaping capabilities and system usage.

**Lakos, A., Phipps, S. (2004). Creating a culture of assessment: a catalyst for organizational change. *Libraries and the Academy*. 4(3):345-361.** This paper describes the why there need for a culture of assessment in library systems in in order to facilitate organizational change and how a culture of assessment can be created.

**Lehman, W.E.K., Greener, J.M., Simpson, D.D. (2002). Assessing organizational readiness for change. *Journal of Substance Abuse Treatment*, 22:197-209.** This article describes a comprehensive assessment instrument for organization readiness for change (ORC). The rationale and structure of the instrument and its psychometric properties are discussed. There are 4 categories of the ORC instrument with associated scales: 1) motivation for change (program needs for improvement, immediate training needs, pressures

for change), 2) Adequacy of resources (offices, staffing, training, computer access, e-communications), 3) Staff attributes (growth, efficacy, influence, adaptability), and 4) Organizational climate (mission, cohesion, autonomy, communication, stress, change).

**Maurer, R. (2001). Build a foundation for change. Association for Quality & Participation. Fall:38-39.** This article provides a change readiness assessment tool that includes 9 questions in the following areas: 1) history of change, 2) direction, 3) cooperation & trust, 4) culture, 5) resilience, 6) rewards, 7) respect, control and saving face, 8) impact on status quo, 9) skill and managing change. Brief guidelines for interpreting the results are provided.

**Nemeth, L.S. (2003). Implementing change for effective outcomes. Outcomes Management. 7(3):134-139.** This paper reviews the concept of change, definitions, and the literature on change. A research project funded by the Agency for Healthcare Research Quality investigating the effectiveness of a quality improvement model in primary care settings is discussed using this material. Communication, leadership, coordination of activities, and integration of the changes into practice patterns are essential to achieving positive outcomes of an intervention designed to improve quality.

**Parker, T.W. (1997). Assessing the change-readiness of your organization. Bank Marketing, 29(4):28-29.** This article presents the Coopers & Lybrand/Warner Burke Model of Organizational Change. Samples of questions to assess 12 areas of the model are provided. The twelve areas are: 1) External Environment, 2) Mission & Strategy, 3) Leadership, 4) Culture, 5) Structure, 6) Management Practices, 7) Systems/Policies/Procedures, 8) Work Climate, 9) Skills and Job Match, 10) Motivation, 11) Individual Needs and Values, 12) Performance.

**Trahant, B., Burke, W.W. (1996) Traveling through transitions. Training & Development. February: 37-41.** This article also discusses the Coopers & Lybrand/Warner Burke Model of Organizational Change as well as its application to a major financial-services firm.

**Suchman, A.L. (2001). Error reduction, complex systems, and organizational change. Journal of General Internal Medicine. 16(5):344-6.** The author reviews the IOM report Crossing the Quality Chasm, providing comments and thoughts on organizational change specifically in relation to the utility of complexity theory in suggesting change strategies for complex systems.

**Sudharatna, Y., Li, L. Learning Organization Characteristics Contributed to its readiness-to-change: a study of the Thai mobile phone service**

**industry. Managing Global Transitions. 2(2):163-178.** This paper investigates the relationship between LO characteristics and an organization's readiness to change as demonstrated by mobile service providers in Thailand. It was found that LO characteristics (i.e., cultural values, leadership commitment and empowerment, communication, knowledge transfer, employee characteristics, and performance upgrading) are correlated to an organization's readiness to change.

**Texas Christian University Surveys** – these are various surveys for assessing organizational readiness to change for behavioral change programs

TCU Survey of Organizational Functioning

TCU Survey of Organizational Functioning Scales and Item Scoring Guide

TCU Survey of Organizational Functioning (Program Director Version)

TCU Survey of Organizational Functioning (Program Director Version) Scales and Item Scoring Guide

TCU Survey of Organizational Functioning (for Staff in Social Agencies)

TCU Survey of Organizational Functioning (for Staff in Social Agencies) Scales and Item Scoring Guide

TCU Survey of Program Training Needs (Program Director)

TCU Survey of Program Training Needs (Clinical Supervisor and Clinical Staff )

## 2. Guideline Implementation/ Evidence-Based Practice

**Bartels, S.J., Dums, A.R., Oxamn T.E., Schneider, L.O., Arean, P.A., Alexopoulos, G.S., Jeste, D.V. (2002). Evidence-Based Practices in Geriatric Mental Health Care. *Psychiatric Services*, 53(11): 1419-1431.**

This article provides an overview of the evidence base for geriatric mental health clinical practice. The authors review the evidence base for different types of interventions, as well as barriers and approaches to implementing evidence-based practice (EBP) in mental health service delivery systems for older adults. Successful approaches to implementing change emphasize moving beyond traditional models of continuing medical education to include educational techniques that involve the learner, as well as systems changes interventions such as integrated care management, implementation toolkits, reminders, and decision support technology. The authors suggest that an organized strategy is needed for facilitating the systematic and effective implementation of EBP.

**Benfield, L.E. (2003). Implementing Evidence-Based Practice in Home Care. *Home Healthcare Nurse*, 21(12):804-811.**

This article reviews a model of quality improvement to guide system change that can be used to implement evidence. The model suggests that there are three stages that must be considered: 1) building awareness of EBP; 2) improvement efforts focus on building system and provider-level structures and work processes to enable staff to use evidence, 3) directing improvement efforts to refine the implementation and evaluation of best practice across disciplines and programs. This article also includes a checklist for assessing agency readiness or the feasibility of implementing evidence – See Figure 2 for dimensions that influence the use of best practice.

**Berenholtz, S., Pronovost, P.J. (2003). Barriers to translating evidence into practice. *Curr Opin Crit Care*. 9:321-325.** The authors briefly review evidence regarding changing behavior of physicians and discuss the limitations. The concepts of independent redundancy, teamwork and reduced complexity are discussed and applied through a discussion two examples in the ICU to demonstrate how implementing these concepts could improve the quality of care.

**Collum, T.L., McColl, E., Rousseau, N., Soutter, J., Steen, N. 2005. Guidelines in professions allied to medicine. *The Cochrane Collaboration. Issue 3.*** This systematic review identifies and assesses the effects of studies of the introduction of CPGs in nursing, midwifery and other professions allied to medicine. A systematic review of studies examining the effects of CPGs showed that despite limited research, there is some evidence that guidelines can improve care and that professional roles can be substituted



effectively, for example a nurse can perform the function of a physician in certain circumstances.

**Fornilli, K. Organizational Readiness for Implementing Evidence-Based Practices. (2005). Journal of Addictions Nursing, 16:87-89.** This brief article discusses the organizational factors that influence the adoption of innovative, evidence-based practices. The author discusses several conditions, models, factors, tools and resources that can be used to implement and sustain individual and organizational change.

**Pipe, T.B., Wellik, K.E., Buchda, V.L., Hansen, C.M., Martyn, D.R. (2005). Implementing Evidence-Based Nursing Practice. MEDSURG Nursing, 14(3): 179-184.** This article describes a process framework for translating evidence into practice and illustrates its application using a case study. The framework includes 6 phases: 1) assess the need for change in practice, 2) Link problem intervention and outcomes, 3) Synthesize best evidence, 4) Design practice change, 5) Implement and evaluate change in practice, and 6) Integrate and maintain change in practice.

**Humphris, D. (1997). Implementing research findings in practice. Nursing Standard. 11(3):49-56.** This article discusses various issues to consider when preparing to implement research evidenced in practice and focuses on how to prepare for and implement knowledge in the form of a CPG into practice. The article reviews operational definitions of diffusion and use of research evidence, discusses barriers to the use of evidence, and briefly discusses what is required for implementation (i.e., planning, creating a conducive climate, active education, developing a supporting infrastructure such as quality or clinical audit, and embedding change). A quiz on the content is provided at the end of the article for submission to a Royal College of Nursing competition.

**Mortimer, R.J., Sewell, J.R., Robertson, D.M. Napier, M.T., Leigh, J.A., Long, P.W. (2004). Lessons from the Clinical Support Systems Program: facilitating better practice through leadership and team building. MJA, 180:S97-S100.** This article discusses the Clinical Supports Systems model which is suggested to be effective because of its simplicity and scope. The model consists principles and/or strategies under three headings: 1) Leadership, multidisciplinary teams and practice improvement, 2) Use of evidence and data collection, and 3) Consumer contributions to better practice.

**Niesen, K.M. Quirk, A.G. (1997). The process for initiating nursing practice changes in the intrapartum: findings from a multi-site research utilization project. JOGNN, 26(6):709-717.** This article discusses the process of implementing a research-based protocol (the Second Stage Labor

Nursing Management) at 40 sites in North America. Factors involved in implementing and adhering to the protocol are discussed in a qualitative fashion (e.g., innovation, creativity, persistence, determination, collaboration, administrative/leadership endorsement, effective site coordinators, evaluation).

**Ockene, J.K., Zapka, J.G. (2000). Provider education to promote implementation of Clinical Practice Guidelines. CHEST, 118:33-39.** This article reviews clinician educational strategies and considers them within the context of complementary strategies carried out at the organizational and clinical settling levels, and outlines challenges and recommendation for clinicians' continuing education. The authors suggest that education activities require leadership support, reflect compelling evidence, use multiple strategies and teaching techniques, and engage learners in skill building and problem-solving.

**Rashidan, A., Russell, I. (2003). Towards better prescribing – a model for implementing clinical guidelines in primary care organizations in the NHS. Clinical Governance, 8(1):26-32.** This paper presents a six-step model for implementing guidelines for prescribing. The model was developed using the results of 25 semi-structured interviews with GPs and primary care academics, as well as a literature review of guideline implementation and changing prescribing behavior. The six steps include: 1)choose the guidelines, 2)identify influential people, 3)identify organizational factors (i.e., resources, competing priorities, practice organization, hardware and software, 3)plan and adopt an implementation strategy, 4)monitor the resulting adherence.

**Roe, B., Watson, N.M., Palmer, M.H., Mueller, C., Vinsnes, A.G., Wells, M. (2004). Translating research on incontinence into practice. Nursing Research, 53(6S):S56-S60.** This brief article reviews the factors that influence incontinence translating research into practice (TRIP). Several implementation strategies and partnerships (e.g., CPGs and protocols, clinical pathways, partnerships between orgs, model for use of the UI guidelines in nursing homes in the U.S.) are discussed. Also discussed are various implementation strategies that incorporate change theory (e.g., clinical guidelines, education, facilitators, change agents, perception of research, confidence in evaluating research, time for implementation, organizational support, range of individual determinants). Finally, future directions and principles for furthering incontinence TRIP are discussed.

**Richens, Y., et al. (2004). Getting guidelines into practice: a literature review. Nursing Standard, 25(18):33-40.** This article consists of a literature review to identify the most effective approaches to implementing clinical guidelines in nursing practice. Guidelines are discussed under the following headings: 1) Format and delivery of the guideline and guideline recommendations, 2) Education and training, 3) Change agents, 4) Clinical audit,

5) Other influencing factors. The authors conclude that there is a lack of clear evidence about which interventions are most effective and in what circumstances. However, this article offers some insight into successful implementation strategies.

**Rycroft-Malone, J., Harvey, G., Seers, K., Kitson, A. McCormack, B., Titchen, A. (2004). An exploration of the factors that influence the implementation of evidence into practice. *Journal of Clinical Nursing*, 13:913-924.** This article discusses the multiple factors that may influence the implementation of evidence into practice, including: 1) the nature of the evidence, 2) the quality of the context, 3) the type of facilitation required to enable the change process.

**Simpson, D.D. (2002). A conceptual framework for transferring research to practice. *Journal of Substance Abuse Treatment* 22(4):171-182.** Using studies from technology transfer and organizational behavior, the author presents a heuristic model of key factors that influence the process of transferring research-based interventions and procedures to practice. This process includes four action steps: 1) Exposure (training through lecture, self-study, workshops, or expert consultants, 2) Adoption (intention to try an innovation), 3) Implementation (period of trial usage of the new innovation to allow testing of its feasibility), 4) Practice (incorporating an innovation into regular use and sustaining it). Influences on the stages of change are also discussed, including: institutional readiness for change, resources, climate and staff attributes. Organizational-level assessment tools from originate from Texas Christian University are discussed and their preliminary application results described.

**Tilley, S., Chambers, M. The process of implementing evidence-based practice – the curate’s egg. *Journal of Psychiatric and Mental Health Nursing*, 11:117-119.** This short paper reports on a 3-year longitudinal project of introducing evidence-based practice into a mental health organization. The process adopted by the Steering Group, as the principal change agent is discussed. An initial survey conducted to assess staff needs indicated three types of need: 1) educational, 2) resources, and 3) organizational dynamics. Outcomes were mixed and barriers to implementation are discussed (e.g., poor motivation, lack of confidence, lack of knowledge of the EBP process, limited access to learning resources, poor teamwork, insufficient time, staff transfers, etc.).

**Thurston, N.E., Kathryn, M.K. Implementing evidence-based practice: walking the talk. (2004). *Applied Nursing Research*. 17(4):239-247.** This paper describes the application Russworm and Larrabee’s (1999) six-step model for evidence-based practice by 10 nursing teams to seek answers to clinical questions over the course of one-year. Steps include: 1) assess need for

change, 2) link problem to interventions and outcomes, 3) synthesize best evidence, 4) design practice changes, 5) implement and evaluate, 6) integrate and maintain. The model was found to be a useful mechanism in practice but a number of additional strategies needed to be incorporated.

**Torrey, W.C., Drake, R.E., Dixon, L., Burns, B.J., Flynn, L., Ruch, A.J., Clark, R.E., Klatzker, D. Implementing evidence-based practices for persons with severe mental illnesses. *Psychiatric Services* 52(1): 45-50.** These authors summarize perspectives on how to best change and sustain effective practice from the research literature and from the experiences of administrators, clinicians, family advocates, and service researchers. They describe an implementation plan that involves the usage of toolkits to implement consistent evidence-based practice. The toolkits will include written material, web-based resources, training experiences, and consultation opportunities. Special materials will address the concerns of mental health authorities (funders), administrators of provider organizations, clinicians, and consumers and their families.

**Young, J.M., Ward, J.E. (2001). Implementing guidelines for smoking cessation advice in Australian general practice: opinions, current practices, readiness to change and perceived barriers. *Family Practice*. 18:14-20.** This article discusses the findings of a mail survey of randomly selected GPs in Australia to assess the opinions, current practices, readiness to change, and perceived barriers to change. The authors conclude that a multi-component intervention approach is required for effective implementation of smoking cessation guidelines. They also suggest that the use of a readiness to change tool to 'individualize' strategies for guideline implementation should be explored.

**Zwarenstein, M., Reeves, S., Barr, H., Hammick, M., Koppel, I., Atkins, J. (2005). Interprofessional education: effects on professional practice and health care outcomes (Review).** The Cochrane Collaboration. Issue 3. This paper consists of a systematic review of interprofessional education to assess the impact of IPE on professional practice and/or health care outcomes. Although a large number of studies were identified on the evaluation of IPE, none of the studies met the inclusion criteria for the review and therefore, it was found that there is no conclusive evidence about the effectiveness of IPE.

### 3. Organizational Learning

**Jerez-Gomez, P., Cespedes-Lorente, J., Valle-Cabrera, R. (2005). Organizational learning capability: a proposal of measurement. Journal of Business Research, 58:715-725.** This paper presents a measurement scale for OL capacity supported by the results of a validation study covering a sample of 111 Spanish firms from the chemical industry. The scale identifies specific elements within four dimensions that are hypothesized to form learning capability – 1) managerial commitment, 2) systems perspective, 3) openness and experimentation, and 4) knowledge transfer and integration.

**Lenox, M., King, A. (2004). Prospects for developing absorptive capacity through internal information provision. Strategic Management Journal, 25:331-345.** This article explores the role managers may play in developing absorptive capacity by directly providing information to agents in the organization that might potentially adopt a new practice. The authors find that the effectiveness of managerial information provision depends on the degree to which potential adopters have information from other sources. Information from previous adopters and past events reduces the effect of information provision, while experience with related practices amplifies it.

**Easterby-Smith, M., Crossan, M., Nicolini, D. (2000). Organizational learning: debates past, present and future. Journal of Management Studies, 37(6):783-796.** This paper comprises a review of the development of the OL field. Key debates are identified in the timeline of past, present and future.

**Tjosvold, D., Zi-you, Y., Hui, C. (2004). Team learning from mistakes: the contribution of cooperative goals and problem-solving. Journal of Management Studies, 41(1):1223-1244.** This article examines the team-level variables, such as psychological safety and shared mental model, can help overcome barriers to learning from mistakes. Structural equation analyses were performed on teams working in a sample of organizations in Shanghai, China. Results suggest that cooperative goals and problem solving promote learning from mistakes.

#### 4. Adoption/ Implementation of Innovations

**Hausman, A., Stock, J.R. (2003). Adoption and implementation of technological innovations within long-term relationships. *Journal of Business Research*, 56:681-686.** This study builds and tests models of adoption and implementation as a function of influence, dependence, and relational variables. Results of this study on electronic data interchange (EDI) adoption in hospital supply chains indicate social influence achieves higher adoption rates than either coercive or non-coercive influence efforts. Communication and participative decision-making are critical implementation variables.

**Everdingen, Y.V., Wierenga, B. (2002). Intra-firm adoption decisions: role of inter-firm and intra-firm variables. *European Management Journal*, 20(6):649-663.** This paper discusses a test of a conceptual model in which two sets of variables are hypothesized to influence intra-firm adoption decisions: 1) variables from inter-firm diffusion literature (i.e. perceived information characteristics, organization characteristics, and network participation), and 2) variables related specifically for intra-firm analyses of innovation acceptance (communication, level of conflict, influence of top management, and social influence among peers). Results show that the proposed intra-firm variables are important explanatory variables that should be included in intra-firm analyses. Inter-firm variables had differential effects among departments, indicating a need for intra-firm analysis.

**Frambach, R.T., Schillewaert, N. (2002). Organizational innovation adoption: a multi-level framework of determinants and opportunities for future research. *Journal of Business Research*. 55:163-176.** This paper discusses the literature on innovation adoption and technology acceptance and proposes an integrated framework for innovation adoption that addresses adoption decisions at two levels: organizational and individual (see Figure 1). Future directions for research are also provided.

**Young, G.J., Charns, M.P., Shortell, S.M. (2001). Top manager and network effects on the adoption of innovative management practices: a study of TQM in a public hospital system. *Strategic Management Journal*. 22:935-951.** This paper reports findings from a study that combined two theoretical perspectives – top manager and network/institutional – to examine the factors influencing organizations to adopt innovative management practices. The study setting was a system of public hospitals and the innovation was Total Quality Management (TQM). Study results indicate that both top manager and network/institutional factors are important determinants of whether and when organizations adopt innovations. The relative importance of

these two sets of factors appears to change as an innovation becomes more widely diffused.

**Gagnon, Y. (2001). The behavior of public managers in adopting new technologies. *Public Performance and Management Review*. 24(4):337-350.** This paper reports on a study of the behavior of managers and the impact of this factor on the successful adoption of technologies. The goal of the paper is to develop a typology of management behavior and to test its implications for information technology management in public administration. A review of Stevenson's Model of administrators and entrepreneurs is provided. Five dimensions comprise this model: 1) strategic orientation, 2) commitment to seize opportunities, commitment of resources, control of resources, and management structure. The first 4 factors are supported by a questionnaire administered to 600 public administration graduate students.

**West, J., Berman, E.M. (2001). The impact of revitalized management practices on the adoption of information technology: a national survey of local governments. *Public Performance and Management Review*. 24(3):233-253.** This paper describes a U.S. national survey conducted with city managers in cities with a population of more than 50,000 that examined the mutually reinforcing impact of revitalized management practices on the use and effectiveness of new information technologies (and vice versa). Study findings show that information technology strengthens revitalized management practices by increasing new opportunities for risk taking, enhancing open communication, and providing opportunities for showing mutual support. However, IT is found to be only indirectly associated with organizational effectiveness (OE); IT improves OE through the use of revitalized management practices. Results also show that although revitalized management practices do not further IT, other management activities are significantly associated with IT.

**Damanpour, F. Gopalakrishnan, S. (2001). The dynamics of the adoption of product and process innovations in organizations. *Journal of Management Studies*. 38(1):45-65.** This study examines the dynamics that govern the adoption of product and process innovations at the firm level over time. Questions such as: Which type of innovation lead or lag adoption of the other type? Does the adoption of one type of innovation lead or lag the adoption of the other type? And would the pattern of adoption of innovation types have an effect on organizational performance? Using data from 1982-1993 on a sample of 101 commercial banks in the US, we find that 1) product innovations are adopted at a greater rate and speed than process innovations, 2) a product process pattern of adoption is more likely than a process-product pattern, 3) the adoption of product innovations is positively associated with the adoption of process innovations, and 4) high-performance banks adoption product and performance innovations more evenly than low-performance banks.

## Appendix 2. Structured Interview Guide

### Participant Information Sheet

**Title of Project:** Factors that Impact Patient Safety Practice Change Initiatives in North American Acute Care Hospitals

**Principal Investigator:** Dr. Whitney Berta

**Co-Investigators:** Dr. Ross Baker & Dr. Jane Banaszak-Holl

**Funding Agency:** Center for Health Management Research (commissioned paper)

**Thank you for your interest in our research project. Before participating in the interview, we ask that you read this Participant Information Sheet and complete the Consent to Participate form located on page 5 of this document.**

**Project Description.** I (Dr. Whitney Berta) and my colleagues, Dr. Ross Baker (University of Toronto) and Dr. Jane Banaszak-Holl (University of Michigan) have been commissioned by the Center for Health Management Research to write a paper that elaborates on the concept of “organizational readiness” for patient safety practice change among acute care hospitals operating in North America. We are close to completing a review of the academic literature and would like to extend our scope to include insights gained through several structured interviews with individuals like you who we consider to be experts in the area of patient safety practice change implementation. The data from these interviews will be analyzed and used in conjunction with insights from our literature review to develop a draft framework to guide hospitals or their internal units in preparing for patient safety practice change.

**Voluntary Participation.** Your participation in the interview is entirely voluntary. During the interview you may refuse to answer any questions, or conclude the interview at any time and by doing so withdraw from involvement in the project. You do not have to answer any questions or discuss any subject during the interview if you do not want to.

**Protection of Your Confidentiality.** We would like to make a tape recording of the interview. It is important to record the meeting so that we collect the experiences and information shared by you correctly. Only the researchers (named above) and the doctoral student (Mr. Larry Hearld) will be permitted to listen to the tape. We will create a type-written document from the recorded information. The typed document will **not** contain information that identifies you



and will only be seen by the researchers. The recorded tape will be destroyed when the typed document is created.

**Risks and Benefits.** Whether you chose to participate or not will have no impact on your employment status or working conditions. There is no direct benefit to you from participating in the interview.

**For Further Information.** If at any time following the interview you have questions about the project, we invite you to contact the Principal Investigator, Dr. Whitney Berta (Tel: 416-946-5223).

**Factors that Impact Patient Safety Practice Change Initiatives in  
North American Acute Care Hospitals  
Interview Questions  
Rev. July 19, 2005**

**INTRODUCTION (5 minutes)**

We intend to talk with you over a 60 minute interval (or a lesser interval, depending upon your availability) about 2 of your practice change experiences – 1 which you consider to be a particular success, and 1 which you consider to be less successful or illustrative of a failure to change patient safety practices in an organization in which you have worked or have experience. We prefer to discuss practice change experiences with which you were/are directly involved, and that are: 1) safety related, 2) complex, in that they (i) involved multiple disciplines and (ii) were broad in scope, engaging individuals from multiple units, functions or levels in your organization, and 3) represent radical change (as compared to incremental change) from prior practices.

For each of the 2 initiatives, we will begin by asking you to take 10 minutes to describe them and tell us why you consider them to be a success, or a failure. Then, we have a series of follow-up questions to ask you about the factors – structural, past experience, cultural, communication, leadership, and resource-related --that research in knowledge transfer suggests are influential in transfer initiatives.

**INITIATIVE DESCRIPTIONS (20 minutes)**

Within the context of your organization or one with which you are familiar, please describe a patient safety practice change initiative that you consider to be a success and another that you consider to be a failure -- or less successful. In describing the initiatives, discuss aspects including: what motivated the change, who led the change, who it involved, what it entailed and the scope and magnitude of change, and why you consider it to be a success/failure. We will begin with the initiative you consider successful (10 minutes for description) and conclude with the less successful initiative (10 minutes).

**STRUCTURED INTERVIEW QUESTIONS (30 minutes)**

For the two initiatives you described, we will address the following questions. We will begin with the initiative you consider successful (15 minutes for questions/discussion) and conclude with the less successful initiative (15 minutes).

**► Structure**

How does decision making occur in your organization (i.e. centralized, decentralized, varies according to type of decision)? How has this type of decision making impacted the success/failure of the initiative you just described?

Based on your past experience with change, is there sufficient staff to support and sustain change generally? ...and to support change that specifically involves the use of patient safety best practices?

Are there particular roles that individual staff has played in past change initiatives? (e.g., boundary spanner, champion, opinion leader) How have the presence/absence of these roles impacted the success/failure of the initiative you just described?

Are there particular structural mechanisms that have been used in past change initiatives (e.g., task force, standing committee/CQI committee, interdisciplinary...)? Have any of these been more/less influential on the success/failure of the initiative?

How critical have any of these – roles or structural mechanisms -- been to the success/failure of past change initiatives generally? ...to change involving the use of patient safety best practices specifically?

**► Knowledge base**

Have you had prior experience initiating practice change in your organization? In your opinion, did this prior experience impact the success/failure of the initiative?

What are the factors that contributed most to facilitating the change?

What factors presented the greatest challenges/barriers?

**► (Learning) Culture**

Does your organization have values and goals in place that explicitly relate to the capturing, sharing, and creation of new knowledge? Did these contribute significantly to the success/failure of the initiative? Why or why not?

**► Communication**

With respect to the initiative you described, were there adequate formal and informal communication systems to support information exchange around the change? What aspects of communication contributed most significantly to the success/failure of the change initiative?

Did your organization use a formal dissemination program/plan to facilitate communication around the change? Did this contribute/detract from the success of the initiative? How could it have been improved, if at all?

► **Leadership**

Was presence/absence of leadership support for this initiative an important aspect of its success/failure? Please explain.

Was staff been sufficiently supported through change? Why or why not?

Does formal leadership attempt to engage (expert) opinion leaders in planned change efforts? Have these attempts generally contributed to the success/failure of the change initiative? Explain.

► **Resources**

Was adequacy of financial and/or human resources important to the success/failure of the practice change initiative?

Was (lack of) staff buy-in a factor contributing to the success (failure) of the change initiative? How was staff buy-in sought?

**GENERAL CONCLUDING QUESTIONS (5 Minutes)**

Do you believe that these prior experiences have equipped you with the necessary knowledge and skills to undertake change involving the use of patient safety best practices? Why or why not?

How would you describe the general views and attitudes toward change among your peers?

Do you believe that your peers have the necessary knowledge and skills to undertake change involving the use of patient safety best practices? Why or why not?

How would you describe the general views and attitudes toward change among staff?

Comment on the extent to which your organization's culture supports change and values the application of research evidence and best practice.

In your opinion, at this point in time, does staff have the necessary knowledge and skills to undertake major/significant/radical, complex change involving the use of patient safety best practices? Why or why not?

## Consent to Participate

**Title of Project:** Factors that Impact Patient Safety Practice Change Initiatives in North American Acute Care Hospitals

I, \_\_\_\_\_ have been invited to take part in a 60-minute structured interview as part of a research project whose purpose is to understand what factors are important to the success or failure of patient safety practice change initiatives in acute care hospitals operating in North America. I understand that participation in the study involves my engaging in discussion with Dr. Whitney Berta, principal investigator on this project, and Mr. Larry Hearld, a doctoral student with the University of Michigan engaged as a research assistant on this project. The interview will be tape recorded with my consent, and a typed copy of the interview will be made for the purposes of qualitative data analysis.

During the interview, I will be answering the questions outlined on the Interview Question Guide to which this Consent Form is attached.

I understand that during the interview I may refuse to answer any questions, or conclude the interview at anytime and so withdraw from involvement in the project. I do not have to answer any questions or discuss any subject in the interview if I do not want to.

I understand that if I do not participate in the interview my employment will not be affected in any way. I also understand that I may not benefit directly from participating in the interview.

I have been told that the information from the taped interview will be handled in a way that protects my privacy. My comments will remain confidential. No information that identifies me will be disclosed. I will not be identified in any report or presentation which may arise from the study.

The above research procedures have been explained to me. Any questions have been answered to my satisfaction. I have been given a signed copy of this form to keep. I understand the above and hereby voluntarily consent to participate in this study.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name (Print)

**Upon completion, please fax this form to 416-978-1466, addressed to:  
Attn: Dr. Whitney Berta  
Department of HPME, Faculty of Medicine, University of Toronto**

## **Appendix 3. Assessment Tool (DRAFT)**

### ***Organizational Readiness for Practice Change in Patient Safety***

#### **A. Leadership**

▶ Senior leadership has identified clinical leaders who have organizational credibility, linkages with administrators and other clinicians, and are familiar with the organization's culture.

▶ Credible clinical leaders are engaged with senior leadership in discussions relating to the patient safety practice change initiative from inception.

▶ Credible clinical leaders communicate (verbally and/or in writing) their commitment to the patient safety practice change initiative to other clinicians and staff.

▶ Credible clinical leaders demonstrate their understanding and commitment to the patient safety change initiative by enacting changed behaviors, and through offering consultation to their peers and colleagues.

▶ Clinical leaders are retained by senior leadership with adequate support including funding for time in implementation and for investment in resources needed for implementation.

▶ Clinical leaders are recognized publicly for their commitment to the patient safety practice change initiative through incentive programs including corporate recognition programs.

▶ The job of clinical leaders are revised to reflect new behaviors, routines, and care practices.

#### **B. Communication**

▶ A common structured language is understood and used by clinicians to describe medical errors and events that contribute to them.

▶ A critical language is used by all hospital staff to alert others of error-conducive events or situations.

#### **C. Structure**

▶ Structural capabilities are present that support intra-organizational transfer and communication around the patient safety practice change.

▶ Consideration is given to the resources that will be needed to support the patient safety practice change initiative.

▶ Structural mechanisms are in place to facilitate intra-organizational communication and information flow relating to the patient safety practice change initiative.

#### **D. Culture**

▶ A cultural assessment is completed in the pre-implementation stages of the patient safety practice change initiative.

▶ Culture is employed as a means of reinforcing desired safe behaviors.

▶ Goals around achieving a safety culture are established as part of the patient safety practice change initiative.

#### **E. Resources**

▶ Incentives for clinical leadership are in place to encourage and sustain behavior change related to the patient safety practice change initiative.

#### **F. Evaluation**

▶ Goals are set regarding the patient safety practice change initiative, and measures are established against these goals.

▶ Mechanisms are put in place in which progress against the goals are reviewed, reported, and can serve as the basis for further action.

#### **G. Process**

▶ A strategy for change is developed that allows for the emergence of optimal change solutions from among those that are trialed.

**Appendix 4. Articles Reviewed**  
Full Copies, Alphabetical by First Author