4-2003

Evaluation of the Systems Theory Based Interdisciplinary Patient Safety Practice Guideline on Restraint Reduction and Fall Prevention

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EVALUATION OF THE SYSTEMS THEORY BASED INTERDISCIPLINARY PATIENT SAFETY PRACTICE GUIDELINE ON RESTRAINT REDUCTION AND FALL PREVENTION

by

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A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Science
Department of Occupational Therapy

Western Michigan University
Kalamazoo, Michigan
April 2003

ACKNOWLEDGMENTS

To my thesis committee: Ben Atchison, Ph.D., OTR, FAOTA, Diane Dirette, Ph.D., OTR, and David Orchanian, MPA, OTR, BCG: Thanks for the continuous words of encouragement, guidance and sharing of your invaluable knowledge.

To my wife, Denise Eberth, a very special thanks for all of your support during this busy time in our lives.

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Patient safety remains one of the most profoundly complex and important issues in healthcare systems especially regarding the use of restraint and the prevention of falls. Current topic guidelines suggest a "systems approach." These guidelines, however, oriented toward solution application using analytical problem-based approach. The development of this practice guideline was in response to a desire for theory-based practice that could guide outcomes. This practice guideline transforms systems theory into a guide for use by a leader/manager and a tool for the practitioner to rethink patient safety in a more holistic manner. This study was conducted in critical care, older adult behavioral, and long-term care settings to demonstrate the effectiveness of this practice guideline and its applicability, regardless of individual system attributes. Phase I – System Learning and Change, consisted of training the direct and indirect care staff; and Phase II – System Outcomes, consisted of output data to identify a special cause variation as a result of the training. Results indicate that direct and indirect care staff's knowledge, skills, and perceptions regarding their ability to make decisions improved. System outputs demonstrated a decline in restraint use in critical care and reduced fall occurrences in all three settings.

TABLE OF CONTENTS

Table of Contents—continued

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

An attempt to control a patient with the application of physical restraint or the use of chemical restraint is a complex care issue fraught with inherent risk to both patients and staff. Restraint is frequently associated with many well-documented process complications and adverse outcomes. Restraint continues to be necessary at times despite advances in restraint reduction strategies as a means to prevent patient injury to self and others.

The effective and appropriate management of complex individual patient needs, behaviors, and organizational outputs to ensure good safety outcomes is a challenging proposition for healthcare systems. The recipients of healthcare services, whether they are referred to as patients, residents, clients, or customers, have very different cultural, physical, social, personal, spiritual, life stage and virtual contexts to their lives (AOTA, 2002). However, they also have very common expectations related to outcomes.

Today, many healthcare systems continue to struggle to resolve the dilemma of how to safely and effectively reduce restraint use and prevent falls to meet the intent of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards and Centers for Medicare/Medicaid Services (CMS) regulations. Healthcare systems desire to prevent falls; ensure the safety of patients, staff and visitors, provide quality cost effective care and remain viable in the current managed care system. At the same time, these organizations are experiencing diminishing nursing levels and resources as the elderly population

increases. As various systems merge they become increasingly complex and managing a change in paradigm within them can be difficult.

Healthcare organizations, whether they are long-term care, medical or behavioral, experience rapid changes in technology, changes in length of stays and changes in the reimbursement system. This fast pace of providing health services can place heavy strains on patients and rigid, complex hierarchical healthcare systems. Regardless of the individual healthcare system's resources and demands, all healthcare organizations seek to provide individualized, safe, compassionate and effective healthcare to those in need. The degree of organizational complexity, boundary control, effective communication, knowledge limitations, staff perceptions, and their interdependent relationships with one another in a healthcare system contain significant potential for either change or non-change re-enforcing of the status quo. These interdependent and interrelated system dynamics directly affect the efficiency of restraint reduction and fall prevention efforts, and are often not fully appreciated in a comprehensive manner or managed appropriately to obtain the desired outcome.

REVIEW OF THE LITERATURE

Many lessons were learned concerning restraint reduction and the link to fall prevention strategies in long-term care since the implementation of the Omnibus Budget Reconciliation Act (OBRA) of 1987 that recognized a resident's right to be free from restraint. Some of those lessons include: 1) the need to focus on the resident's needs using an individualized plan of care, 2) the pivotal role of the interdisciplinary team in conjunction with the family and resident, 3) the utilization of a comprehensive resident and environmental assessment, 4) the identification of underlying resident motivations of manifested behaviors that lead to restraint use or falls, 5) that physical restraints do not necessarily prevent falls and that removing them do not necessarily increase falls (Capezuti 1998, Tinetti 1992, Evans 1990), and 6) there is a potential for viable alternatives to restraint that maintain patient rights, freedom and safety.

Some of the common statistics indicate falls and their consequences are a leading cause of death for adults 65 years and older (Davis, 1995) and preventing fall is a major reason for restraint use in nursing homes (Capezuti, 1998, Terpstra, 1998). Most researchers conclude that restrained patients are subject to the same or added fall risk as are individuals without restraints (Tideiksaar, 1998). In fact, facilities that restrain patients experience a higher incidence of serious injuries following falls (Tinetti, 1992). According the the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Costs of Fall Injuries Among Older Adults fact sheet dated January 2000, "The average direct cost for a fall was $1,400.00 in 1994 for

a person over the age of 65. The total direct cost of all fall injuries for people age 65 and older in 1994 was $20.2 billion. By 2020, the cost of fall injuries is expected to reach $32.4 billion". Consequenty, the identification of effective restraint reduction and fall prevention strategies are of paramount importance to healthcare systems and patients, and are fundamentally linked at a multitude of systemic levels.

Since implementation, these lessons learned were generalized to medical/surgical and behavioral healthcare settings with varying degrees of success. According to Mion (2001), it is unknown whether long-term care interventions can be successfully applied to acute care settings. Strategies appropriate in one setting may not be in others (Tideiksaar, 2002). The acute care setting (Medical Intensive Care, Critical Care, Emergency Department, Neonatal Intensive Care) are uniquely different from a long-term care setting for a multitude of reasons. It is also reasonable to question the effectiveness of these stategies in any other care setting that differs from long-term care.

Mion (2001), described outcomes of restraint reduction programs in 14 units of two separate acute care hospitals that utilized different staffing structures. The intent of the study was to examine the usefulness of restraint alternatives in the acute care setting. The design included identification of systems or processes that contribute to negative outcomes, design and implementation of targeted strategies to address the identified processes, and ongoing and regular evaluation of desired outcomes. This study utilized four

components to the Restraint Reduction Programs; administrative, educational, consultative and feedback.

The standard of practice on patient safety has dramatically risen over recent years with the increased attention/reporting on medical errors as well as injuries and deaths related to restraint use and fall occurrence. According to the Joint Commission on Accreditation of Healthcare Organizations, as many as fifty percent of their standards relate to patient safety issues (JCAHO, 2002). Additionally, federal standards continue to encourage and support a cultural change regarding the use of restraint and seclusion.

In 1998, the Hartford Courant, an investigative newspaper, published a 50-state survey that reported 142 restraint or seclusion related deaths that had occurred in a 10-year period between 1989 and 1999 in mental health facilities and group homes throughout the United States (Hartford Courant, 1998). In contrast, the Harvard Center for Risk Analysis estimates the number of deaths per year between 50 and 150, that is 500 to 1,500 deaths per year (Hartford Courant, 1998).

It was the number of deaths in behavioral healthcare settings due to a lack of regulation, oversight, and training that motivated families and advocacy groups to appeal to the United States Congress. This successful campaign led to the implementation of more stringent regulation for the use of restraint and seclusion. In addition, it increased the pressure for behavioral healthcare *and* non-behavioral healthcare settings in which restraint is used for behavioral reasons to seek more appropriate alternatives. Greater emphasis was placed on ensuring

trained and qualified staff applied restraint, that a patient assessment be performed by a Licensed Independent Practitioner within one hour, that the family be incorporated into each episode as appropriate, and that each incident of restraint be reviewed for measures that can be used to prevent future occurrences. The JCAHO Behavioral Healthcare Restraint and Seclusion standards, effective January 1, 2001, now apply more to the intent of the restraint use rather than the type of care setting, as they had in the past. Restraint standards and regulations are more focused on encouraging cultures of safety and the development and use of viable alternatives.

The JCAHO standards are quite clear that restraint is to be used as a last resort regardless of care setting. Other alternatives must be attempted and documented prior to the initiation of restraint; except in an emergent situation to prevent patient self-injury or injury to others. Additionally, after a restraint is applied it is imperative to reduce the use of restraint as quickly as possible to prevent deleterious effects.

The JCAHO established six National Patient Safety Goals for 2003: 1) Improve the accuracy of patient identification; 2) Improve the effectiveness of caregiver communication; 3) Improve the safety of using high-alert medications; 4) Eliminate wrong-site, wrong-patient, and wrong-procedure surgery; 5) Improve the safety of using infusion pumps; and 6) Improve the effectiveness of clinical alarm systems. The JCAHO did not specify the use of these goals to the issue of restraint/seclusion or fall prevention, however, two of these goals do hold relevance: 1) improving caregiver communication, and 2) the effectiveness of

clinical alarm systems. The context of the JCAHO the goal for caregiver communication is directly related to physician's orders. However, it is also directly applicable to *all* caregiver communication related to restraint use and fall prevention. Likewise, it is also extremely important that the alarms being used to monitor patients at risk for falls or alternatives to restraints be adequate in terms of audibility for the needs of the environment, staff *and* patients.

In response, many healthcare systems have implemented various ideas, lessons learned, and programs attempting to achieve restraint-free or "nearly" restraint-free care environments. As a result, the literature identifies a common theme. All of these programs lack one key ingredient that may significantly contribute to success: a theoretical basis to provide for the development of a structured framework from which to manage the interactions of components and subsystems within a healthcare organization/system/setting in order to provide improved safety. All previous attempts to introduce lessons from long-term care seem doomed to a limited impact due to the causative manner in which they are applied.

There are many established guidelines related to restraint reduction and fall prevention. The American Geriatrics Society (AGS) Position Statement, Guidelines for Restraint Use, dated January 1997 advocates for the "highest level of independent functioning emphasizing an individualized approach to affect the highest quality of life possible". These guidelines advocate the reduction of all restraints due to the potential for harm and include eight points: 1) If restraint is used, it is to be used "sparingly" after assessment and documentation has

indicated that no other alternative is available and it must occur collaboratively with the staff, patient and family, with regular reassessment for appropriate alternatives, 2) focus on staff *and* patient behaviors that may precipitate the decision to use restraint and eliminating the cause, 3) use of padded and properly fitting restraints, 4) use of restraint for short duration to provide emergent treatment, prevent self-injury or injury to others, 5) regular provision of restraint release and care for patient needs, 6) regular reassessment for the continuing need for restraint, 7) staff education, and 8) research viable alternatives to restraint.

The American Association of Geriatric Psychiatry (AAGP) Advocacy Fact Sheet, dated February 2002 shares concerns with the AGS regarding discouraging the use of restraints with elderly patients and the inappropriate use of restraint and seclusion. The AAGP agrees there are many problems with restraint and that their use is in opposition to promoting independence and quality of life. While the AAGP advocates for "the provision of all medically necessary treatments in an environment that is safe and humane for patients and staff" (American Association of Geriatric Psychiatry, 2002), they acknowledge that increased attention to patient needs may reduce the need for restraint. The focus on patient needs is a lesson learned directly from the long-term care industry and can be applied to all care settings.

These existing guidelines serve as goals upon which to focus care, but do not delineate how to achieve them. They do not provide a conceptual framework sufficient for all staff to utilize in a variety of care settings to help them consider

the potentially vast number of system interactions, resources, and components. Fall Prevention Guidelines for older adults recommend "multifactorial interventions" (American Geriatric Society, 2002), or a "systems or comprehensive systematic approach" (Tideiksaar, 2002). Which is to accurately say, the issue of fall prevention, and restraint reuduction are recognized as complex and multifactorial in nature and require a comprehensive approach patient focused. However, the "comprehensive systematic approach", remains based on the analytical application of the lessons learned in long-term care. The Veterans Health Administration, National Center for Patient Safety, also suggests a "systems approach" to improve patient safety, but does not identify and deliniate theoretical assumptions or concepts useful in a conceptual framework to guide caregiver practice. The JCAHO Failure Modes Effects Analysis and Root Cause Analysis encourage a systematic review, but do not identify the potentially useful theoretical assumptions or concepts of systems theory that may contribute to the process of preventing or discovering the cause of adverse outcomes. While all of these existing systematic approaches are extremely useful in their own right, they remain atheoretical in the sense that they do not provide an adequete understanding of systems theory structure to guide direct *and* indirect caregivers thought processes in proactive planning and implementation, therefore requires the establishment of a new guideline for practice (Mosey, 1996).

In contrast, a systems theory-based conceptual framework or practice guideline provides both direct and indirect caregivers a theoretical base with

assumptions, concepts and definitions, function-dysfunction continua, indicators of function and dysfunction, postulates regarding change, and guidelines for evaluation and application (Mosey, 1996). According to a systems theory perspective, a typical healthcare system has various degrees of hierarchy and dynamic interdependent interrelationships with a reimbursement system and a society. Each unique healthcare system/organization/setting is comprised of three dynamic subsystems, and within those subsystems at the lowest conceptual level are ten interdependent components refered to as action points or "leverage points" according to Haines (1998). The three subsystems are comprised of the Organization-Environment, Staff, and the Patient. The ten individual action point components of change or non-change within the subsystems are: 1) Vision and Goal; 2) The Environment of Care; 3) Policy, Procedures and Routines; 4) Organizational Teamwork; 5) Restraint Use; 6) Staff Education; 7) Communication and Control; 8) Restraint Alternatives; 9) Patient Behaviors; and 10) Family Participation.

THE INTERDISCIPLINARY PATIENT SAFETY PRACTICE GUIDELINE ON RESTRAINT REDUCTION AND FALL PREVENTION

Analytical Thought Versus Systems Theory

Typical organizational restraint reduction and fall prevention efforts are based on an analytical approach; that is, the process begins by reviewing outcomes data to identify deficiencies, then initiating corrective action to address that identified deficiency. It is important to note that the corrective action process does not begin until a common or special cause variation in outcomes data focuses attention on the need for action, which constitutes a reactionary-based system. Responses are biased by system instabilities that become evident when change occurs.

Analytical or reductionistic problem solving is effective in closed system causality. In a closed system, isolated from the surrounding environment, a problem and the corresponding solution may be more manageable as they are limited by the established environmental parameters. However, organizations and the people they are comprised of, are not entirely closed systems, as they interact with their external environments.

Using analytical thinking to solve patient safety problems would have us identify *the* cause variation, and identify and implement *the* corrective action. In doing so, the process of solution finding becomes narrow or linear, one problem and one solution. Analytical thinkers lament, "I feel like I've been putting out fires". They focus on one problem at a time seeking the quick fix before moving

on to the next "fire". The focus is on the immediate problem rather than long-term goal oriented solutions.

The practice of analytical thinking is evidenced in the literature as lessons learned in long term care settings are applied to patient safety situations in emergency departments, critical care, intensive care or behavioral health care settings. Too often, the impact of a completely different care setting can be marginalized. As a result, when the solution doesn't work as expected, the interventions viability is questioned. In the course of this process we negate critical system elements that have significant potential impact on the outcome and can go unrecognized until we change our perspective. Albert Einstein said, "the significant problems we face cannot be solved at the same level of thinking we were at when we created them" (Thorpe, 2000). We must change the way we think; we must change our perspective in order to solve patient safety problems in various care settings.

Systems theory provides an explanation as to the phenomenon regarding the ongoing process interaction of various elements that creates different living system outcomes (Hanson, 1995). Individual societies have unique reimbursement and healthcare systems that are living entities that respond to their external environments, demands and resources. Additionally, those healthcare systems are composed of unique departments, sections, teams, individuals and most importantly patients they serve. Systems theory offers a change in perspective in order to manage the different system components related to patient safety outcomes.

There is no one established approach to reduce restraint use on general medical and surgical units (Frengley, 1998). Likewise, there is no single approach to reduce restraint and prevent patient falls regardless of care setting. A complete analysis of the relevant factors will reveal system improvements that can further reduce the use of restraint and prevent falls. Systems Theory provides an effective foundation from which to develop a framework to conceptualize the use of lessons learned or best practices in a variety of healthcare systems.

A conceptual framework of a typical healthcare system has dynamic interdependent interrelationships with a reimbursement system and society, three dynamic subsystems, and at the lowest conceptual level ten interdependent components. The three subsystems are comprised of the Organization-Environment, the Staff, and the Patient. The ten individual components that are the action points of change and non-change are: 1) vision and goal, 2) the environment of care, 3) policy, procedures and routines, 4) organizational teamwork, 5) restraint use, 6) staff education, 7) communication and control, 8) restraint alternatives, 9) patient behaviors, and 10) family participation.

Previously held practice beliefs with regard to patient safety and rights must be modified to suit a variety of situational needs, applied with flexibility and newness of thought, and always focused on functional long-term outcomes. According to Albert Einstein, "to raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science", (Bartlett's, 2002). Patients have the right to be free from

restraint, to be treated with respect and dignity, and to be provided a safe and responsive restorative-focused care environment. Reducing restraint and preventing falls is not an achievable end identified by a target quota, rather it is the management of an ongoing, long-term process that requires commitment throughout an entire healthcare system by leadership, management and all direct care providers focused on the achievement of a clearly stated mission, vision and goals.

Theoretical Base

General Systems Theory is the basis for this practice guideline. Systems Theory is the ability to see the world, life, issues, organizations and individuals in terms of wholes or relational patterns (Hanson, 1995). Systems or organizations in this context are not completely discernable when viewing their individual components in isolation; likewise individual components of an organization are not completely discernable without viewing their dynamic interdependent relationships with other components (Von Bertalanffy, 1968). When utilizing this theory one attempts to understand and resolve problems with an initial focus on the greater whole and the existing relationships between the subsystems and components. Environments contain organizations that contain departments that contain work-teams that contain one-to-one relationships and ultimately single individuals that are stand-alone systems (Haines, 1998).

Theoretical Assumptions

Systems theory consists of laws or assumptions that apply irrespective of the components involved (von Bertalanffy, 1968). They provide organizational truths and terminology to understand and manipulate patient safety phenomenon within a healthcare system.

Causality

This is the most common and pervasive means of solving problems in organizations today. The principle of causality is linear, direct cause-and-effect is

implies action and reaction (Hanson, 1995). The Joint Commission on Accreditation of Healthcare Organizations recommends healthcare organizations review systems to identify process problems with failure modes effects analysis or after an adverse outcome, perform a root cause analysis to identify the causative problems and implement corrective action. When organizations focus efforts to resolve specific problems other unrecognized interrelated problems await resolution.

Corrective efforts then are merely generated by waves of analytical cause variations and consequently create a reactionary rather then a preventative environment. When the next cause variation in the data appears, the process begins again. Causality is a short-term start and stop sequence, focusing on one problem one solution on the same conceptual level without a comprehensive long-term plan and solution.

Openness

Openness is a measure of boundary awareness or organizational transparency. That is, an open or closed organization is dependent on and defined by the people who comprise the organization and their willingness to accept new ideas and changing methods in light of discoveries. The people in an organization also have a direct impact on the permeability of patient safety initiatives within an organization. Open systems are aware of their limitations of knowledge, they seek to find new information and respond non-defensively when it is introduced. Open systems have willing participation from many hierarchical

organizational levels. Open systems interact with their environment, and challenge the status quo resulting in a movement toward order. Closed systems are not aware of their limitations in knowledge, do not seek to find better ways of practicing, and react defensively if they are introduced. Closed systems do not interact with their environment, and embrace the status quo resulting in a movement toward disorder and demise.

Information and Entropy

Information and entropy (disorder) is concerned with the degree of shared knowledge and its effect on order and disorder in a given system. As more information is shared confusion decreases. Information sharing in the organization can be a measure of order or chaos. Information and the sharing of information are critical to success. It is important to consider how the sharing of information can empower or disable decision-making.

Feedback

Feedback can be positive or negative and is directly associated with information and communication and the potential it possesses for change and non-change in organizations. Feedback is a self-regulating mechanism that can affect the degree of entropy within a system and can provide guidance and direction to steer the system (Hanson, 1995). According to Von Bertalanffy (1968), positive feedback creates order out of disorder (chaos) and can foster goal directed behavior. Negative system feedback can be disabling and

destructive. Feedback can articulate goals, values, purpose and mission; it can clarify communication, enable patients to achieve higher standards, identifies the degree of success or failure with an initiative and converts output to input (Hanson, 1995). Feedback takes many forms from formal to informal. Feedback is a critical element to systems, as it is the link between the outputs and determining where the organization is at the present time by identifying patterns of change and nonchange (Hanson, 1995).

Interrelationship and Interdependence

All systems have interdependent relationships and are characterized by their degree of openness or flexibility with other subsystems and components within an organization. When system boundaries, organizational or individual, are permeable the system can operate with flexibility and respond with more ease to external demands regardless of the resources available. The assumption of interrelationship and interdependence is fundamental and can be observed when one aspect of a system changes it affects change in other areas as well. However, when the boundaries are dense equilibrium becomes fixed in a cultural practice that can be difficult to change. When systems become fixed and resistant to change organizational death is the likely outcome.

Equifinality and Multifinality

The law of equifinality is concerned with the ability of organizations to begin change processes at different starting points but come to the same

conclusion or final state of equilibrium. According to the law of multifinality, organizations begin change processes at the same starting points and end up with different conclusions or final states of equilibrium. The point, regardless of the organizations beginnings with patient safety initiatives it will at some point in the process reach equilibrium (a steady state), or not (Hanson, 1995). This assumption emphasizes the criticality of beginning system changes with the end in mind first; what is the outcome to achieve. This assumption encourages one to examine outputs in context, determine how they will know the outcomes were reached, where the organization or individual is at today, and determine what needs to change to produce the desirable system results.

Trial and Error

Trial and error simply infers, "if at first you don't succeed, try, try again", as a critical assumption to trying new ideas (Eberth, 2001). According to Von Bertalanffy (1968) trial and error is an assumption closely associated with the process of feedback. Continuous, multilevel feedback is a tool utilized to support trial and error effort. Feedback and trial and error are assumptions to move action points to energize change, or can contribute to its demise. The correct type and amount of feedback and change can build a system, while the wrong type and amount of feedback and change can bring down a system. Trial and error creates opportunities for and enables learning by encouraging exposure to new ideas and countering the paralysis caused by not knowing what you don't know.

Action Points

An action point or "leverage point" (Haines, 1998) is a component in the organizational or individual system where pressure can be applied to facilitate a change in a process. All of the subsystem components in this practice guideline are action points.

Context and Content

The interaction of an environment (context) and observable patient behavior (content) assigns a degree of function and is fundamental to a systems perspective. Hence, the interaction between extrinsic (environmental) and intrinsic (patient) fall related factors has meaning in terms of functional outcomes. Typically, healthcare system context dictates to a large degree what is acceptable patient behavior content and impacts restraint use or fall prevention. Occupational behavior (content) is patient produced, is typically goal directed and can be modified either by facilitating a change in the individual's ability to process or by accommodating the behavior and creating an environment (context) of safety.

The Law of Optimum Size

This assumption states the larger an organization grows the longer the chain in communication that consequently can limit the organization's growth beyond a certain point. As the complexity of the organization increases (internal

elaboration), feedback has farther to travel and is farther from the realities of daily services provided.

The Law of Instability

The assumption of organizational instability states that unstable equilibrium due to fluctuations (cause variations) can result from the interactions with various subsystems. Instability is a normal part of change but is expected to reduce quickly as feedback is applied and returns the system to a new state of equilibrium. Changes in one subsystem affect changes in others.

The Law of Oligopoly

The law of oligopoly states that if there are *competing* units, the instability of their relationships, friction, and conflicts increase as the number of those units decrease. Competition in organizations and individuals is not desirable when striving to achieve the same purpose.

Input-Transformation-Output Model

This is a systems thinking mindset and is key to application of systems theory. One must think of problems with this model of an open system, as it re-enforces a systems perspective and prevents the tendency to choose short-term, quick fixes. All living systems interact with their environment in this manner.

Dynamic Equilibrium

This represents a steady state within a system regardless if it is open or closed. An open system has a free-flow of information across boundaries versus a closed system that does not have a free-flow of information. Both open and closed systems can establish a static culture of "the way we do things here" and must be avoided to ensure growth and development and prevent degradation of the system. Dynamic equilibrium is a degree of chaos and provides a measure of predictability when changes occur.

Internal Elaboration

This refers to systems that become complex and bureaucratic. Process flexibility slows, change slows and new ideas are seen as competitive to the established culture.

Goal Seeking

All living systems are goal seeking when they exert energy to fulfill needs. Consider Abraham Maslow's Hierarchy of Needs as an example of an individuals desire to fulfill goals. On the lowest level are physiological needs and the highest-level self-actualization needs (Maslow, 1976). Behaviorists would say a behavior re-enforcer needs to have meaning and is a motivator or goal for the patient to obtain. Expectations are goals ascribed for others to achieve. When expectations are placed on individuals who ascribe meaning to the goal, the recipient typically

focuses their energy to achieve those expectations. Organizations are no different; they were created by people to accomplish goals.

Hierarchy

All living systems have hierarchies, but to varying degrees of complexity and depth. Policies can be representations of the internal elaboration, depth, and degree of centralized control of a hierarchy or not. An increased number of detailed policies could be indicative of a closed system that has embraced a rigid hierarchical status quo culture. It could also be indicative of a system that is in the process of change where increased structure is required while a new practice is established. If policies, procedures or routines remain unchanged for extended periods it may produce a negative bias toward entropy.

Concepts and Definitions

The concept of this practice guideline addresses the provision of patient safety as it relates to restraint reduction and fall prevention in healthcare systems. Patient safety is of great concern to healthcare providers and can be defined as the prevention of adverse outcomes such as a "Sentinel Event" (Joint Commission on Accreditation of Healthcare Organizations, 2003). A healthcare system functions within a permeable hierarchical environment of a reimbursement system and society (see Figure 1). The hierarchy is permeable in that society, the reimbursement system and a specific healthcare system interact with each other; hence, the system circles in (see Figure 1) have contact with one another. When examining a healthcare system with a systems theory perspective there are three primary subsystems and ten observable components. These components are at the lowest conceptual level and are action points for change in a healthcare system. The three subsystems of a healthcare system are: 1) the organization-environment, 2) the staff, and 3) the patient. The hierarchical organization of the subsystems is flattened and overlapped (see Figure 1) in order to emphasize the significance of their interdependent relationships rather than a layered hierarchy of influence. In addition, organization of the subsystems in this manner intentionally focuses the perspective of the system during evaluation and application. The ten components of the subsystems are: 1) vision & goal, 2) the environment of care, 3) policy, procedure & routines, 4) organizational teamwork, 5) restraint use, 6) staff

education, 7) communication & control, 8) restraint alternatives, 9) patient behaviors, and 10) family participation.

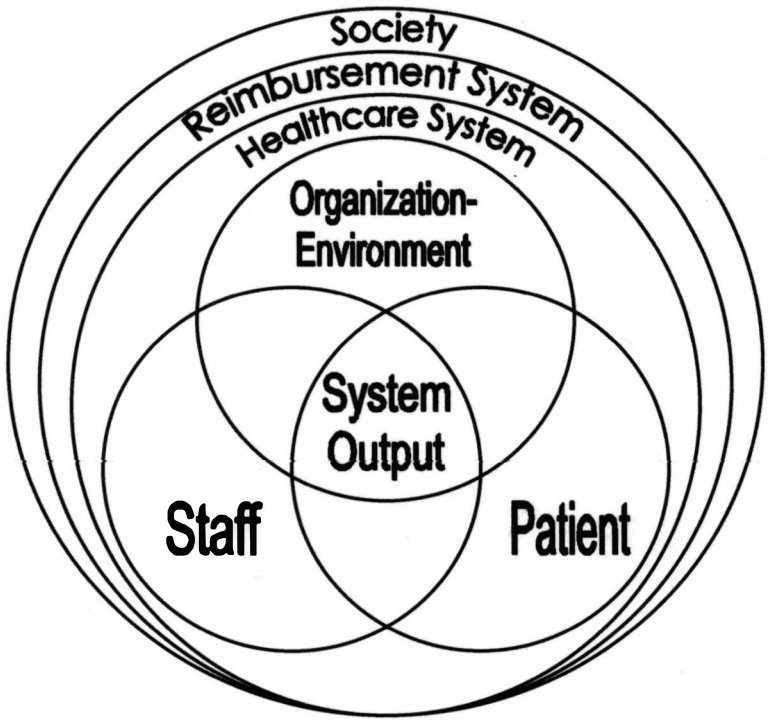


Figure 1. The systems theory perspective of a healthcare system content within the context of a society and its reimbursement system.

The Organization-Environment Subsystem

Healthcare organizations are highly complex human service-oriented systems, often with many hierarchical layers and varying styles of control and authority, goals, environments, communication, routines, and cultural norms (see Figure 2). They are unique systems in that they are the only industries where people serve people's healthcare needs. Patients can be fearful and anxious about what will occur during the course of *their* treatment and are comforted knowing their care providers project a positive image and communicate well as a

team. When one aspect of the organization-environment does not properly communicate the patient's needs with another or provide the necessary feedback to the recipient of those services, anxiety about the quality of those services can increase and can filter into other seemingly unrelated system interactions.

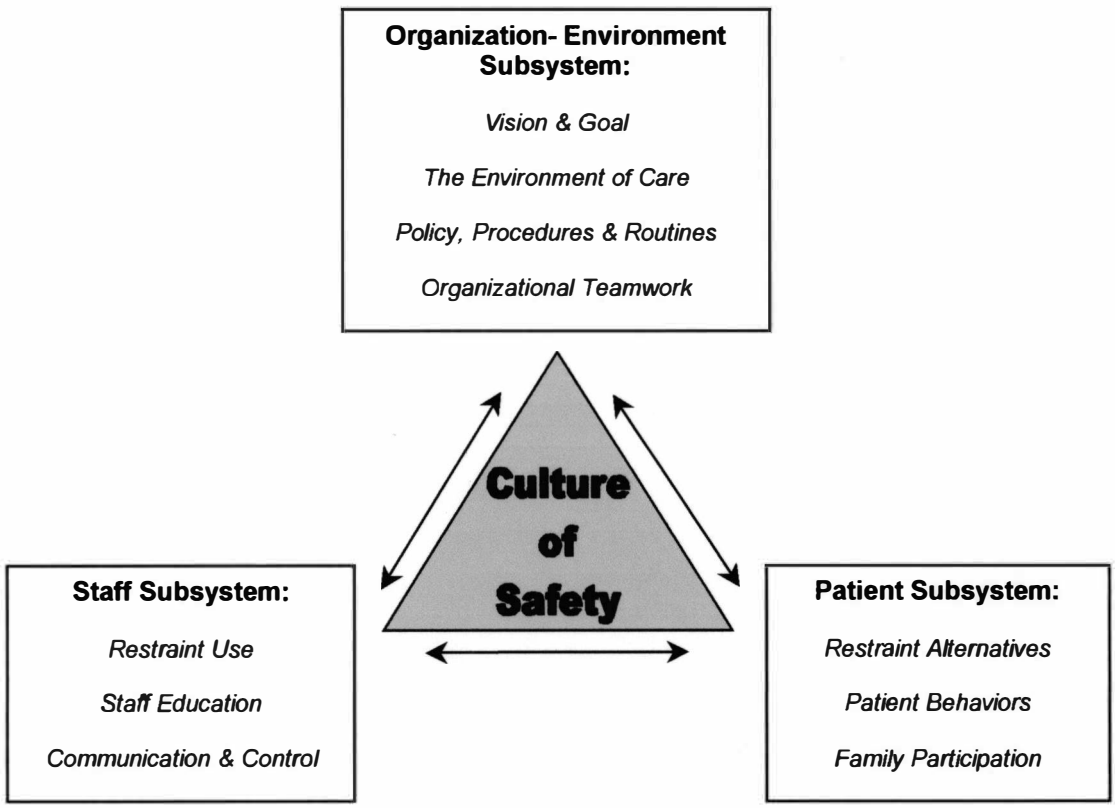


Figure 2. The ongoing organizational subsystem interactions with corresponding "action points".

The Vision & Goal Component

Development of vision, goal, and philosophy statements by the team members encourages participation by sending a clear message of feedback that system-wide involvement is valued. Vision statements should be set to present a challenge, a goal to reach for, but also must be attainable based on a realistic

appreciation for the capabilities of that organization. They should clearly state what is to be achieved, and should be brief, easy to remember and frequently revised as progress is demonstrated. Goals provide focus, direction, motivation, and a sense of purpose to efforts. Likewise an organizational philosophy on safety and the use of restraint is a statement of motivating concepts, principles or beliefs that bind and direct efforts.

The Environment of Care Component

A restorative care environment is one that tends to restore health or strength by people in that environment who are charged with and interested in the patient's care in a physical space that appropriately supports and challenges the patient's ability to grow and develop. The term restorative care is closely associated with restorative care units where patients receive skilled services versus a unit that is not restorative and is focused on maintaining patient abilities. For the purposes of restraint reduction and fall prevention, the question of restorative care is one of semantics rather than unit classification or reimbursement of services provided. Patients who receive extended care need to be challenged to grow. Providing expectations with goals and feedback encourages people to perform and creates a restorative care focused environment.

The Policy, Procedure & Routines Component

Policy is the formalized, written version of what is to be done, procedure is the formalized system to implement policy, and routines are the day-to-day realities, "the way we do things" or existing culture. Surveyors want to see that healthcare staff is doing what they state they are doing in policy. JCAHO standards and CMS regulations are more stringent on restraint and seclusion than ever before. The trend in the JCAHO standards is to consolidate and continue the movement toward restraint-free care in all settings as appropriate. Given this reality, the issue is setting appropriate policy and procedure that provides strategic guidance while enabling realistic operational flexibility so direct care providers can actually do what the organization says it is doing. Policy needs to be simple and easy to understand, but firmly based in the intent of the standards and regulations. Direct care providers need to have input into policy development as this encourages teamwork and a participative work environment. Participation promotes good communication, understanding, reduces entropy, is goal focused and promotes high-performance organizations (Block, 1993). In order to enable staff to do their job according to the standards and regulations, they need to be enabled to think for themselves based on comprehensive education, and accurate and timely information.

The Organizational Teamwork Component

Creating a winning team that will serve the needs of the patient is a challenge for every organization. Every team project has a purpose or goal, but

also needs to be a clear partnership in order to develop a sense of enthusiasm, expectation and promote creativeness. Restraint reduction and fall prevention programs require a high degree of innovation and creativity (Braun, 2000). It is important to develop an atmosphere of cooperation, and respect, with well-established roles. Leaders need to provide direction and perspective so the team understands how their work fits into the scope of the organization, as well as the larger scheme of the community and business environment. Leaders and team members need to be creative and open to ideas that may initially seem outside the established norm. Brainstorming is a tool that requires broad participation and diverse perspectives to challenge the status quo, and as a result creative cultures will develop, according to Chaleff (1998). In his book Chaleff states, "when a group relishes this spirit of creative challenge it rolls back its limits and finds new ways of pursuing its purpose" (p. 88). Leaders can also be managers, and need to provide the tool(s) necessary to enable the direct care provider to complete their work. Additionally, direct care providers can be leaders when they exercise initiative and inspire others to do the same. These same participative ideas can be applied to the direct care provider and patient relationship.

A comprehensive and transparent restraint reduction and fall prevention program is reliant on the creation and utilization of partnerships. There are a number of practical ways in which this can be accomplished and demonstrated. As mentioned previously, policy needs to accurately reflect the seriousness of restraint use, based in appropriate standards and regulations for operational consistency, but also a commitment to reducing restraint and/or seclusion and

preventing falls through teamwork. In addition to appropriate policy, the following methods are suggested: 1) develop a facility specific restraint reduction and fall prevention handbook to promote alternatives, 2) develop a restraint reduction and fall prevention consultation process to promote feedback, 3) develop a family and patient information brochure to promote their partnership in the process, 4) computer based and other learning programs/tools to promote continuing education, 5) leadership utilization of the new employee orientation process to share common goals and promote partnership, 6) create an environment for honest data reporting & trust by communicating the need for accurate information, 7) use of a patient safety manager to facilitate goal focused actions, 8) provision of safe and appropriate alternative devices to enable trial and error, 9) standardize restraints to one manufacturer to eliminate confusion and simplify competency, and finally 10) reward successes constantly to encourage change!

The Staff Subsystem

Staff, for the purposes of this practice guideline, is all the employees in an organization. Staff perspectives on the use of restraint and practice habits vary widely by setting and experience (Terpstra, 1998). When those perspectives and practices are based in myth they are to the detriment of the patient and organization and can also be observed and measured. Likewise, appropriate staff perceptions on restraint use, restraint alternatives and falls based in fact may benefit both the patient and organization and can be used to challenge the status quo.

The Restraint Use Component

According to the Joint Commission on Accreditation of Healthcare Organizations (2003):

> In its broadest context, *restraint* is any physical method of restricting a patient's freedom of movement, physical activity, or normal access to his or her body. Restraint may be used in response to emergent, dangerous behavior; as an adjunct to planned care; as a component of an approved protocol; or, in some cases, as part of standard practice. Because restraint may be necessary for certain patients, health care organizations and providers need to be able to use restraint when essential to protect patients from harming themselves, other patients, or staff. They also need to be aware of the associated risks of both its use and nonuse. (p. 146)

There are four common patient behaviors that precipitate restraint use: 1) to protect from a fall, 2) to prevent disruption of a medical therapy, 3) to manage agitation and aggression, and 4) to manage wandering. The reasons previously listed underscore how pervasive the reductionistic, cause-and-effect treatment paradigm is accepted and simplified. This oversimplification tends to say restraint use is in response to the patient, that the patient's behavioral content was out of context for the expectations in the care environment. For example, nursing students for many years were taught to *never* walk away from a bed unless the side rail was in the upright position (environmental context). Now, we tell those same nurses to leave the side rail down because it is safer and may be a restraint depending on the patient's functional abilities and the intended use of the side rail (new environmental context). A contextual shift occurred in the provision of services, but our reasoning to manage safety has not. It is not only the patient that must be considered, but the system the patient functions within.

Restraints provide no guarantee of protecting the patient, and have significant consequences for their use. These are the well-documented complications with restraint: 1) cardiovascular problems and edema, 2) respiratory problems, 3) incontinence and urinary tract infections, 4) constipation, 5) muscle atrophy and/or contractures, 6) pressure sores and skin breakdown, 7) loss of activities of daily living, 8) lower self-esteem and motivation, 9) social isolation and cognitive decline, and 10) strangulation, falls, and bruising. Restraint should be used as a last resort, when all other practical means of providing safety have failed. Before the application of any device or care approach there are many critical issues to consider: 1) what is the intent or goal for the use of the restraint, device or care practice, 2) can this patient self-release from this device or is there a less restrictive device that could be used to provide safety and allow the patient to self-release, and 3) what are the capabilities of this patient, i.e. can they get out of the bed/chair? These questions will help you determine if the device or care approach is a restraint, restraint alternative or a positional support intended to promote bodily functioning.

The Staff Education Component

Education is a fundamental key to reducing restraint and preventing falls to improve patient safety by enabling staff to make informed choices regarding their own occupational performance. Staff cannot be a full partner in changing practice methods unless there is administrative support for a free-flow of empirical information to change attitudes and perceptions. Also, staff must have

sound information to base their values and beliefs when discussing the issue with family and patients. Education is the first step in providing restraint reduction or fall prevention interventions. Once the patient understands the reason why it is so important to use the call light, they may be more likely to change their behavior pattern and use the light. Otherwise, the older-adult patient may think that they are bothering the staff or may be too proud to call for assistance. The patient may not realize they are at risk for falls or may think they can get up on their own because they were able to get up in therapy.

Consequently, the caregiver must know what, when, how and why to educate. This implies the caregiver must be thoroughly educated on restraint reduction and fall prevention techniques before they can ever begin to convince the patient of the need to partner with the staff for safety. Staff education requires a comprehensive mandatory outcomes-based approach. No amount of regulation, policy, or punitive enforcement will provide a lasting change in staff practice. Lasting change comes from a genuine desire to share information and enabling people with opportunities to learn and grow without fear of punitive actions. Close supervision and enforcement approach is an example of Mc Gregor's theory X assumption (see Figure 3). In contrast, an educational and guidance approach to problem remediation is an example of a theory Y assumption. A theory Y approach enables change and relays trust in the care providers to make appropriate decisions. Positive re-enforcement and education are a much more enlightened method to change practice behaviors and provide greater and longer lasting positive outcomes. Again, the key is education - not

punitive enforcement. In addition to enforcement of accepted appropriate standards of practice it is essential to provide the necessary perspective altering information to empower people. Staff wants to do the right thing; they need to learn the justification as to why practices need to change and provided the tools to do the job right.

Theory X – *Assumptions*	Theory Y – *Assumptions*
1. The average person inherently dislikes work and will avoid it whenever possible.	1. If it is satisfying to them, employees will view work as natural and as acceptable as play.
2. Because people dislike work, they must be supervised closely, directed, coerced, or threatened with punishment in order for them to put forth adequate effort toward the achievement of organizational objectives.	2. People at work will exercise initiative, self-direction, and self-control on the job if they are committed to the objectives of the organization.
3. The average worker will shirk responsibility and seek formal direction from those in charge.	3. The average person, under proper conditions, learns not only to accept responsibility on the job but also to seek it.
4. Most employees value job security above other job-related factors and have little ambition.	4. The average employee values creativity—that is, the ability to make good decisions and seeks opportunities to be creative at work.

Figure 3. Mc Gregor Theoretical Management Assumptions as cited in Owen (2001).

The Communication & Control Component

The central concepts of communication and control theory are information and feedback (Von Bertalanffy, 1968) and are applicable to the concept of the organization. The concept of information and feedback imply a cyclical exchange as the information is received, interpreted, acted upon, and the feedback is initiated. The feedback, in turn, affects the cycle in some manner and, again, information is transmitted. For example, a healthcare organization communicates subjective information, observations, assessments, plans of care, test results, outcomes, billing, and compliance with its documentation, and is a critical

component of the services provided. Consider the potential feedback from a surveyor when staff does not effectively document the use of restraint alternatives prior to the initiation of restraint. Often times, staff does not comprehend what could be considered an alternative, therefore documentation is insufficient and the trial of alternatives cannot be proven. There is a great deal of truth in the statement, "if it wasn't documented it didn't happen".

Healthcare providers set the tone for their environment by the manner in which they speak to one another. Consider a unit that has staff feeding patients by standing in front of them while at the same time shouting across the room to a co-worker in order to share stories. Consider the healthcare provider that has an overtly negative attitude and carries this on the unit, making negative statements/remarks to other providers, especially while in front of patients. What effect could this have on patients? What can be done to improve the style of communication and the negative attitudes in these examples?

Assertive communication can help to avoid power struggles, promote understanding and redirect negativism. Assertive communication is defined as honestly and openly sharing your thoughts and feelings, while considering the rights of others. The sender of the message takes responsibility for their viewpoint without attacking or blaming others, and opens the door for positive responses. However, this style of communication does not guarantee that you will receive a positive response. It does however provide a model for others to follow when they observe the benefits. Healthcare organizations require a great degree of coordination of care between many different people, including

discharge planning and preparing the patient. Assertive communication is essential tool when interacting with patients, families, and other staff.

The Patient Subsystem

The patient as a recipient of services is traditionally conceptualized at the center of a patient-focused care model. However, from a systems theory perspective, the patient is a single subsystem with dynamic interrelationships with the staff, and organization-environment (see Figure 1). The patient is defined by three components that are as follows: 1) restraint alternatives as they are strictly patient specific, 2) the patient who is co-responsible for their behaviors, and 3) the active involvement of the family.

The Restraint Alternatives Component

A device may be marketed as a restraint alternative, but can still be used as a restraint dependent on the patient's abilities to self-release and the intended use by the staff or organization. The staff may use a gait belt to hold a blanket in place on a patient, but if the patient cannot remove the item it could be regarded as a restraint. It is critical that any device or care approach used with a patient be based on respect for their individual needs and abilities (a functional approach). Additionally, one must balance the risks of an intervention verses the benefits and the need to maintain patient safety.

Restraint alternatives mean many things to many people. Some healthcare providers believe that the use of restraint alternatives means that we

are taking risks with our patients (Eberth, 2001), some providers do not know of more than three appropriate restraint alternatives (Terpstra, 1998), and others believe it is anything other than restraint. Obviously, the uncertainty with regards to the definition will create an array of problems within an organization. According to the Joint Commission on Accreditation of Healthcare Organizations (2002), a restraint alternative is defined as those devices, care methods or environmental alterations that enable the patient to have freedom of movement within acceptable parameters of safety. Appropriate application of restraint alternatives to manage behavioral signs and symptoms enable patients and keep them safe. Supportive devices are another matter. According to the JCAHO (2002), they are devices used to improve or maintain the postural support and/or to achieve or maintain normative bodily functioning and are not considered restraints. However, it is important to consider the use of the least restrictive supportive device in all cases. Again, the intent of a supportive device is to enhance patient function not limit it.

The Patient Behaviors Component

Granted, there may be times when a restraint becomes necessary in an emergent situation to protect the patient, staff or others. However, this practice guideline emphasizes a shared responsibility on all conceptual levels for the use of restraint. At times, staff tends to focus only on the management of maladapted occupational performance exhibited by patients, rather than examining the

dynamic impact of predisposing and precipitating factors that contribute to the behaviors.

According Kielhofner (1995) and the Model of Human Occupation (MOHO), occupational behavior is dynamically assembled as a result of the interaction with the environment and consequently the human system self-organizes. MOHO utilizes general systems theory to view the patient as an open system interacting with its environment through goal accomplishment, feedback, input, and throughput. This model is used by occupational therapists to view the occupational functioning of patients and the environment as a factor that influences choices and behavior (Kielhofner, 1995). According to this model the patient consists of three heterarchical and complementary subsystems consisting of volition (personal causation, values, interests), habituation (rules and habits), and performance (skills, occupational behavior). The three subsystem of this model can be considered "action points" for staff to influence change within the individual human systems that they serve or work with.

Identification of behavior patterns is a key to managing potential restraint use and preventing falls. There are various methods for recording patient behavior, but what many staff does not understand is the importance of the process. It is critically important for the overall problem solving ability of the team that all of the details concerning the antecedents, behavior and consequences be reported accurately. Everyone on the team must act as detectives when determining the underlying problem(s) that create the observable signs and symptoms.

Managing problematic behavior correctly can interrupt the assault cycle or extinguish other disruptive behaviors and begins with knowing and respecting your patient, and providing support and compassion. Again, staff education is critical in knowing when, how, and why to act. Of course, one must ask the question; what exactly is a behavioral problem? A behavioral problem could be defined by the expectations of the care environment, expectations of the staff, or by social norms. For example, a patient who frequently pushes a chair around a day room of a psychiatric unit may not be a problem, yet this same situation may be problematic in a family room of an acute medical unit. Problematic or disruptive behavior may be any of the following: 1) emotional outburst, 2) verbal aggression, 3) aggressive behavior, 4) wandering or pacing, 5) resisting care, 6) sleep disorders, 7) unsafe movement, 8) manipulative behavior, and 9) inappropriate sexual behavior. Managing and preventing the assault cycle begins with an understanding of predisposing (violence characteristics) factors and precipitating (trigger) events, and knowing how to manage the cycle at a given point once it begins. The next parts of the cycle are: 1) escalation of anxiety and use of verbal reassurance, support, and redirection, 2) acting out where physical intervention may be required, and 3) de-escalation where the patient will benefit from a therapeutic rapport and understanding. Throughout the process it is important to focus on respecting individual differences and attempting to meet the needs of the patient. This would include respecting cultural and gender differences, fears and anxieties, beliefs, the use of therapeutic touch, humor, listening to what the patient says to understand their perspective.

The Family Participation Component

The utilization of the family and understanding knowledge concerning their relationships to the patient can be an essential element in understanding maladaptive patient behaviors and is a classical example of systems thinking. A nurse manager collects personal information from the family on one of her patients and shares it with her staff by writing this information on a poster titled "Who am I?" and encourages the staff to guess who they think this patient is. She eventually tells them who the patient is and reported that her staff began treating that patient better after they learned more of his history. This is one of many methods to involve the family in the care of the patient. It is also important to discover a patient's triggers that can act as the precipitating event to a violent act. Consider a patient's cultural history and its potential impact on providing care, communication, and outcomes as necessary.

Function/Dysfunction Continua

This practice guideline addresses the issue of patient safety regarding restraint reduction and fall prevention from a systems theory perspective in order to identify the effectiveness of the dynamic interdependent and interrelationship processes and manage change in a healthcare systems with identified conceptual components (action points) within the organization-environment that support a culture of patient rights, freedom, and safety. The probability of function/dysfunction in an organization's ability to reduce restraint and prevent falls is determined by assessing all of the various components. Consequently, as all components are interrelated, change in one affects change in others, probability of entropy increases proportionate to the number and degree of dysfunctional components.

Ten Behaviors Indicative of Function/Dysfunction

I. The Subsystem of the Organization-Environment: Vision and Goal Component

Outcomes Oriented Organization

FUNCTION: The organization pursues patient safety changes by regularly reviewing and utilizing clearly communicated and easily understood vision, purpose, and goal statements.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Organizational goals and objectives are established by all as appropriate.
2. Organizational goals and objectives are universally understood at a seventh-grade education level.
3. Organizational goals and objectives are widely published and accessible for all to read.
4. All staff and patients are educated and oriented to the organizations vision, purpose, and goal and encouraged to participate.
5. Organizational goals and objectives are contextually appropriate to the setting.

Analysis Oriented Organization

DYSFUNCTION: The organization pursues patient safety changes by regularly reviewing and utilizing control chart data to direct problem-solving actions.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Organizational goals and objectives are established only by leadership.
2. Organizational goals and objectives are complex and not understood by all.
3. Organizational goals and objectives are not widely distributed and/or accessible for all to read.
4. Staff and patients are inconsistently and/or incompletely oriented to the organizational goals and objectives and do not enable participation.
5. Organizational goals and objectives are inappropriate to the setting.

II. The Subsystem of the Organization-Environment: The Environment of Care Component

Supportive Environment

FUNCTION: The care approach and environment is supportive of the patient's needs and abilities and able to respond as needed.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Ability to participate in meaningful activities.
2. Pleasant sounds.
3. Privacy is respected.
4. Rooms enable functional performance and are easily modified as needed.
5. When patient needs change the environment changes as appropriate.
6. Fall hazards are considered and modified on admission.
7. Environmental changes are made easily.
8. Staff is empowered to make changes.
9. Staff is aware of environmental impact on functional performance.
10. Color scheme is conducive to visual impairments.
11. Lighting is conducive to visual impairments.
12. Staff utilizes lighting for the patient's benefit.
13. Furnishings are free of potential weapons.
14. Furnishings are arranged to support functional independence.

Unsupportive Environment

DYSFUNCTION: The organization pursues patient safety changes by regularly reviewing and utilizing control chart data to direct problem-solving actions.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Participation in meaningful activities is not provided.
2. Audio annoyances.
3. Privacy is not respected.
4. Rooms disable functional performance and are not modified as needed.
5. When patient needs change the environment remains static.
6. Fall hazards are not considered and modified on admission.
7. Environmental changes are not made as needed.
8. Staff is not empowered to make changes.
9. Staff is not aware of environmental impact on functional performance.
10. Color scheme is monochromatic.
11. Lighting is not conducive to visual impairments.
12. Staff for the patient's benefit does not utilize lighting.

13. Furnishings may contain potential weapons.
14. Furnishings are not arranged to support functional independence.

III. The Subsystem of the Organization-Environment: Policy, Procedures and Routines Component

Appropriate Practice

FUNCTION: Established guidelines are brief and clear; routines are congruent and patient focused; process is guided by overarching organizational goals.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Policy is written and understood at grade school reading levels.
2. Policy enables low levels of control for decision-making based on competencies and those closest to the services.
3. Policy is simple.
4. Routines are flexible and responsiveness; they accommodate individual needs.
5. Policies cross-organizational boundaries.
6. Staff is aware of policy; procedure and routines are congruent.
7. Policy allows many (appropriate) methods to accomplish organizational goals.
8. Trial and error is common and encouraged; when approaches do not work they are modified and used again.

Inappropriate Practice

DYSFUNCTION: Established guidelines are lengthy and confusing; routines are noncongruent and not patient focused; process is not guided by overarching organizational goals.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Policy is written and understood at college reading levels.
2. Policy disables flexible operational decision-making.
3. Policy is complex.
4. Routines are rigid and lack responsiveness; they accommodate individual needs.
5. Policies do not cross-organizational boundaries.
6. Staff does not easily understand policy; procedure and routines are non-congruent.
7. Policy states specific solutions to accomplish organizational goals.
8. Trial and error is uncommon; when an approach does not work it is abandoned rather than modified.

IV. The Subsystem of the Organization-Environment: Organizational Teamwork

Participative

FUNCTION: Team members are open to new ideas and work closely with others to develop solutions.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Expectations for participation in decision-making are high.
2. A sense of community and belonging is high.
3. Focused on the long-term goals of the patient.
4. Ideas flow freely.
5. Cooperation between individuals and organizational units is high.
6. Staff is able to implement creative ideas and solutions.
7. Staff perceives they are able to take ownership of the process.

Directive

DYSFUNCTION: Team members are closed to outside ideas and work independent of other professions and services when developing solutions.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. No group expectations for participation in decision-making.
2. No sense of community and belonging.
3. Focus is on the short-term daily needs of the patient.
4. Ideas are controlled.
5. Competition between individuals and organizational units is high.
6. Staff is not able to implement creative ideas and solutions.
7. Staff perceives no ownership of the process.

V. The Subsystem of the Staff: Restraint Use Component

Infrequent and Appropriate

FUNCTION: The staff is open, flexible, responsive, and interested in least restrictive care approaches.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Competencies are based on the least restrictive measures and safe and appropriate use when necessary.
2. Awareness of precautions is high.
3. Problem solving begins at a higher level; family and others outside the patient-staff interaction are involved.
4. No conflict or competition between patient and staff.
5. Processes exist to reduce future use of restraint.
6. Communication is effective.
7. Everyone is trained on a regular basis on safe and appropriate physical intervention techniques.

Frequent and Inappropriate

DYSFUNCTION: The staff is closed, rigid, unresponsive, and not interested in least restrictive care approaches.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Competencies are based on the application of restraint only.
2. Awareness of precautions is low.
3. Problem solving remains on the same level; reacting to patient behaviors; family and others outside the patient and staff interaction are not involved.
4. Conflict and competition exist between patient and staff.
5. Processes do not exist to reduce future use of restraint.
6. Communication is ineffective.
7. Limited or no staff receives training on safe and appropriate physical intervention techniques.

VI. The Subsystem of the Staff: Staff Education Component

Conscious Competence

FUNCTION: Conscious awareness to knowledge limitations, feedback is positive, open boundaries.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Staff is open-minded to change and learning new methods of care.
2. Awareness of limitations in knowledge.
3. Staff training promotes high levels of understanding regarding restraint.
4. Staff training is mandatory and a stated high priority for injury prevention.
5. Education is comprehensive and outcomes based.
6. System wide training is available for all who are involved in the process of restraint reduction and fall prevention.
7. Leadership provides feedback and guidance to reward successes to modify behavior.
8. Skill development, positive attitudes, and knowledge are components of the education program.

Unconscious Incompetence

DYSFUNCTION: Unaware of knowledge limitations, feedback is negative, closed boundaries.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Staff is closed-minded to change and learning new methods of care.
2. Unawareness of limitations in knowledge.
3. Staff training is limited or nonexistent.
4. Staff training is encouraged or optional.
5. Education when provided is incomplete.
6. Training is provided to direct care providers only.
7. Leadership provides negative feedback to enforce standards and regulations to modify behavior.
8. Education does not address all three components of skill development, attitudes and knowledge.

VII. The Subsystem of the Staff: Communication and Control Component

Operational Flexibility

FUNCTION: The organization uses multiple levels of feedback to coordinate care efficiently and manage content/context behavior.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Positive Feedback used.
2. Multiple levels of feedback are used.
3. Patient is involved in decisions and participates in care.
4. The system clearly relays to everyone that patient safety is a priority.
5. Honest data reporting.
6. Fact-finding.
7. Information flows freely up & down the hierarchy structure.
8. Decision-making is shared.
9. The chain of communication is shortened by lower level systems that enable rapid decision-making.
10. New ideas are sought and reviewed at various organizational levels.
11. Creativity is encouraged and promoted.
12. Peer performance expectations; bottom-up.
13. Teamwork is performance related.

Operational Rigidity

DYSFUNCTION: The organization uses little or no feedback to coordinate care efficiently and manage content/context behavior.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Negative Feedback used.
2. Feedback is not provided.
3. Patient is not involved in decisions or encouraged to participate.
4. Patient safety is not an obvious organizational priority.
5. Misleading data reporting.
6. Blame finding.
7. Information flows predominantly down the hierarchy structure.
8. Decision-making is the responsibility of leadership.
9. The chain of communication & control is long and disables and slows decision-making.
10. New ideas are not actively sought and controlled by low-level managers.
11. Creativity is not encouraged.
12. Leadership performance expectations; top-down.
13. Individual performance is the standard.

VIII. The Subsystem of the Patient: Restraint Alternatives Component

Frequent and Appropriate

FUNCTION: The staff is open, flexible, responsive, and interested in least restrictive care approaches.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Competencies are based on the least restrictive measures.
2. Education emphasizes the least restrictive measures.
3. Patient services are strongly encouraged and utilized.
4. Support is wide spread.
5. Alternatives are easily accessible to those providing services at any hour of the day.
6. A wide variety of restraint alternative devices are available.
7. Successful strategies are shared quickly.
8. Positive feedback is used frequently as rewards.
9. Staff are recognized and praised for their accomplishments.
10. Family involvement is evident.
11. Restraint is discouraged.
12. Education is mandatory.
13. Vision, goal and philosophy are pursued.
14. Environment is flexible.
15. High levels of communication.
16. Policies, procedures, and routines are simple and effective.
17. Teamwork is the norm.
18. Behaviors are understood.
19. Processes are in place to review restraint use and identify ideas outside what is currently known.

Infrequent and Inappropriate

DYSFUNCTION: The staff is closed, rigid, unresponsive, and not interested in least restrictive care approaches.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Competencies are based on the use of restraint
2. Education does not emphasize the least restrictive measures.
3. Patient services are not emphasized.
4. Support is limited.
5. Alternatives are difficult to obtain.
6. Limited to no restraint alternatives are available.
7. Successful strategies are not shared.
8. Negative feedback is used to identify noncompliance.

9. Recognition and praise for accomplishments is not evident.
10. Family involvement is not encouraged.
11. Restraint is viewed as a "protective device".
12. Education is encouraged or optional.
13. Vision, goal and philosophy are not evident.
14. Environment is static.
15. Typical means of communication are used.
16. Policies, procedures, and routines are complex.
17. Staff is individually responsible.
18. Behaviors are not understood.
19. Processes are not in place to identify or promote new ideas.

IX. The Subsystem of the Patient: Patient Behaviors Component

Appropriate

FUNCTION: Remediation and/or management of occupational performance and behavioral outcomes with a systems perspective.

BEHAVIORS INDICATIVE OF FUNCTION:

1. Staff observes their patients for responses to interventions and accurately reports their findings to other members of the team.
2. Staff is trained in the use of verbal interventions.
3. Staff is trained in the use of physical interventions.
4. Staff is trained in the use of environmental management techniques for confused patients.
5. Staff is trained in violence prevention techniques.
6. Staff is trained in multifactor fall prevention techniques and is flexible in application.
7. Staff is trained in descalation techniques.
8. Patient responds appropriately to incentive training when self-initiation skills are impaired.
9. Patient responds appropriately to verbal and written safety education.
10. Patient awareness of limitations is appropriate (not impulsive) or is responsive to intervention.
11. Patient demonstrates appropriate planning and organizational skills to support goal accomplishment.
12. Patient demonstrates an intact problem solving cycle: attention, devise and initiate a plan, ability to access information, and utilization of feedback, ability to modify actions in response to feedback.
13. Patient demonstrates mental flexibility by changing performance in response to environmental changes.
14. Patient is able to generalize new learning to other areas of occupational performance.
15. Education emphasizes behavioral modification principles.
16. Maladapted behavior is understood as an outcome of the patient interaction with the organization-environment.
17. Appropriately assesses and manages pain.

Inappropriate

DYSFUNCTION: Remediation and/or management of occupational performance and behavioral outcomes focused on a cause-and-effect perspective.

BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Staff do not accurately observe their patients for responses to interventions and inaccurately or do not report their findings to other members of the team.
2. Staff is not trained in the use of verbal interventions or do not use effectively.
3. Staff is not trained in the use of physical interventions or do not use effectively.
4. Staff is not trained in the use of environmental management techniques for confused patients or do not use effectively.
5. Staff is not trained in violence prevention techniques or do not use effectively.
6. Staff is not trained in multifactor fall prevention techniques or does not apply in response to changing demands.
7. Staff is not trained in descalation techniques or do not use effectively.
8. Patient self-initiation skills are impaired or do not respond positively to remediation or management techniques.
9. Patient does not respond appropriately to verbal and written safety education or interventions are not effective.
10. Patient awareness is impaired (impulsive) or is not responsive to interventions.
11. Patient demonstrates inappropriate planning and organizational skills to support goal accomplishment or interventions are not effective.
12. Patient demonstrates an impaired problem solving cycle: attention, devise and initiate a plan, ability to access information, utilization of feedback, ability to modify actions in response to feedback or interventions are not effective.
13. Patient demonstrates impaired mental flexibility in response to environmental changes or interventions are not effective.
14. Patient is not able to generalize new learning to other areas of occupational performance.
15. Education does not emphasize behavioral management principles or is not used effectively.
16. Maladapted behavior is not understood as an outcome of the patient interaction with the organization-environment.
17. Inappropriate assessment and management of pain.

X. The Subsystem of the Patient: Family Participation Component

Participative

FUNCTION: The family is actively involved in the care provided.
BEHAVIORS INDICATIVE OF FUNCTION:

1. Family cooperation and participation is actively sought by the treatment team
2. Family participation and communication is a stated expectation with supporting rationale
3. Family is responsible for communicating with the treatment team
4. Family ideas and insight are involved in the process of care
5. Family provides information to the treatment team to foster patient understanding of needs
6. Cultural relevance is considered when determining interventions

Directive

DYSFUNCTION: The family is not actively involved in the care provided and is directed to participate.
BEHAVIORS INDICATIVE OF DYSFUNCTION:

1. Family cooperation and participation is not actively sought by the treatment team and/or is not provided by the family.
2. Family participation and communication is not stated as an expectation.
3. Family is responsible for communicating with the treatment team.
4. Family ideas and insight are not involved in the process of care.
5. Family does not provide information to the treatment team to foster patient understanding of needs.
6. Culture is of no relevance when considering interventions.
7. Behaviors are not understood.
8. Processes are not in place to identify or promote new ideas.

Guide for Evaluation

In accordance with the laws that govern systems theory, clinical evaluation and reasoning takes a top-down approach or a broad system review followed by a narrowing focus to individual components. The review should begin one level higher than the level of the problem and concentrate on the systems resources, demands and their relationship to one another. The focus then shifts to individual subsystems and components and their dynamic interplay (Haines, 1998). In order to be successful, a systems review requires a mindset of openness to view the whole first with its interrelationships then the individual parts that exist within the system (Haines, 1998). Also, a systems review is appropriate to open systems verses closed systems. An open system is such due to its dynamic interactions with the environment in which it exists, whereas closed systems are considered to be isolated from their environment (Von Bertalanffy, 1968).

Where does one begin the process of a system review? The answer to that question is dependent on the role of the reader. If you are a quality or patient safety manager you will have obvious concerns regarding strategic organizational consistency on many levels in your organization. If you are a direct care provider and you are concerned about operational flexibility in providing services. As a direct care provider, your immediate scope of focus is one up from you; typically the unit you are working on at any given time. However, that is not to say you do nothing if the system above that level is not responsive to the needs at your level. Resources are typically not brought to bear until a demand is expressed.

There are many questions to keep in mind when assessing systems and subsystems related to patient safety regardless if you are leading system wide change or preventing restraint use or a fall. Here are some questions to consider in order: 1) what is the goal or output of the effort, 2) how do I know when the goal is accomplished, 3) what is the current level of performance, and 4) what must happen to reach the goal. On a practical basis, therapists typically start at the third question, then establish a goal and determine the observable measure of progress and finally, what must happen to reach the goal. This is analytical problem-based thinking. A systems theory approach starts us at the end of the process or output by identifying mutual goals first. In doing so, it creates an atmosphere of participation and can help motivate a patient. Feedback from the patient consists of demonstrating achievement of performance components that support the stated goals. The next step is to determine the current level of performance through a complete patient assessment. Assessment of the patient will reveal strengths to support the goals or deficits that will impede goal accomplishment. It is at this stage that it will become clear to the staff member as to the realism of the established goals. The last step involves identifying those areas in the patient system that requires remediation, adaptation or compensation to facilitate goal accomplishment. Through the entire process your focus is kept on the eventual outcome, and the feedback forces you to reexamine the accomplishment of the goals in the processes.

Understanding the dynamic interrelated and interdependent relationships within living systems is the key to identifying the component action points of

change and is the focus of evaluation. Restraint use and falls are outcomes of maladapted behaviors within a system context that *expected* a different response. Causality would have us react to the behavior by seeking a corrective measure and then generalizing those measures to other areas, whereas Systems Theory changes the perspective to anticipating and modifying the environment and patient-system to produce the desired outcome and create order.

Assessment content is collected within a specific environmental context perspective. That is, the information should be collected with the end goal in mind; for example, no restraint use, no falls, being a leader in patient safety, or discharge the patient to home. The information collected needs to provide enough insight to determine what changes need to be made to make the living system successful whether it is an organization or a patient. In the case of the patient system it is important to obtain the patient's goals and to inform the patient of the organization goals.

The Model of Human Occupation by Kielhofner (1995) is an occupational therapy practice model concerned with occupational behavior and is based on General Systems Theory. This is an appropriate model to consider when viewing the patient-environment interaction. According to Kielhofner (1995), this model conceptualizes the patient as an open system with three subsystems that regulate choice, lifestyle, and performance and describes the influence of the environment on the patient. These three subsystems are important to understanding the patient's motivation, roles and abilities and determining

specific interventions to prevent restraint use and falls. The Model of Human Occupation uses a process model similar to that of "Systems Thinking" (Haines, 1998) beginning with the output, then feedback, input, and throughput (see Figure 4). Both models are self-regulating and guide the process of dynamic equilibrium. General Systems Theory, Systems Thinking and the Model of Human Occupation emphasize the interdependent relationships that exist in all living systems and are applicable to the patient safety problems of restraint reduction and fall prevention.

Postulates Regarding Change

1. If at one action point an open system changes, then change is likely to occur in other areas.
2. If many components of a system change, then the prospect for change increases.
3. If appropriate environmental modifications are made, then patient function will be enhanced.
4. If performance ability is static, then compensation in the system can allow goal accomplishment.
5. If a restorative care approach is used, then restraint use will decrease.
6. If effective communication is used within an open system, then restraint reduction and fall prevention will be more effective, patient/staff safety and job satisfaction will increase.
7. If employee perceptions regarding restraint are correct, then a decrease and more appropriate use are expected.
8. If employee perceptions regarding restraint alternatives are correct, then an increase and more appropriate use is expected.
9. If staff improves their ability to distinguish the type of intervention used, then documentation compliance and restraint alternative use should increase and restraint should decrease.
10. If the patient is properly observed for behaviors and accurately reported, then patient safety is enhanced and restraint use and falls will decrease.

11. If the family is involved with care then restraint alternative use and fall prevention is more successful.
12. If the leadership promotes a system theory learning approach throughout the organization, then staff will be empowered to affect change.
13. If the entire system is engaged in the process, then change will occur.
14. If all staff participates in establishing a goal, then comprehensive participation will occur.
15. If leadership clearly state a vision and enable the staff to participate in reaching patient safety goals, then change will occur.
16. If an effective mandatory outcomes-based education program is implemented within an organization, then restraint reduction and fall prevention will occur.
17. If staff is open to feedback, then change can occur.
18. If a process becomes an established culture, then the system can become closed and the processes must change to prevent system demise.
19. If appropriate behavior management techniques are used, then restraint use and violence can be prevented.
20. If restraint reduction occurs, then employee turnover will decrease and patient satisfaction will increase.
21. If pain is managed appropriately, then the potential for maladapted behavior is reduced.
22. If signs and symptoms are managed with regular medication review, then the potential for polypharmacy is reduced.

23. If patients are exercised a regular basis, then falls and subsequent restraint use may be reduced.
24. If employees are appropriately educated regarding intrinsic, extrinsic and system components that interact and contribute to falls and restraint use, then the potential for a culture of patient safety increases.
25. If employees understand the definition of restraint, restraint alternative and supportive device, then restraint related documentation would improve.
26. If participation in diversionary activities is encouraged, then restraint use will decrease.
27. If patients are positioned properly, then ability to participate in functional activities will increase and falls and restraint use will decrease.
28. If feedback is properly utilized throughout a system, then communication regarding patient safety will be enhanced.
29. If trial and error is an accepted practice, then solutions to maladapted behavior can be found.
30. If the system is committed to change, then change will occur.

The application of systems theory is a top-down perspective that focuses our attention on the overall environment in which the cause variation or "problem" under review exists, as the problem *is* unique to that particular environment. It is important to consider the environmental external and internal demands and resources to determine what is available to the organization and provide a level of perspective regarding priorities for change.

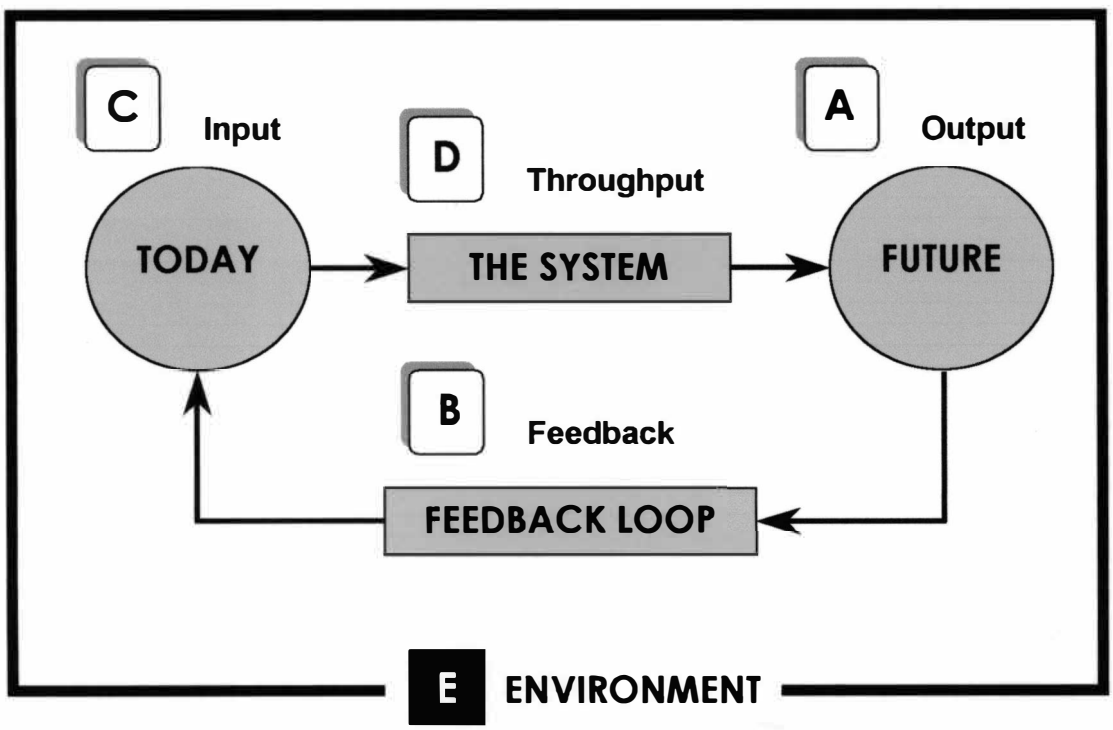


Figure 4. A-B-C-D Systems Thinking Model, with permission from Haines, (1998).

Articulate your vision. If you are the leader of a change effort, be it a leader by position or a direct care provider, determine what you believe about patient safety, because the approach you choose will flow from it. Make your

vision clear and articulate it; this is a critical leadership skill. Be enthusiastic; it's contagious. Set goals, both short-term and long-term.

Design a feedback system. What are you looking for? Determine how you will know that you are achieving your goals. Make your system of feedback reciprocal.

Measure current levels. Use consistent measures within the context of your vision and goals. Never loose site of the overarching goals and never focus on the data.

Apply pressure to action points. This is the most difficult part of the process because you need to consider the potential outcomes. This requires forethought, and participative leadership. Don't be a "bull in a china shop". Build a consensus and support for the change. Look for open "windows" of opportunity in the system to exploit learning. Most important, be ready for resistance; it's a normal reaction to change.

Check the output. What are people saying in the system? What indications are present to show movement is occurring toward the goal?

Reward and encourage steps forward. Feedback again - reward and encourage the smallest of steps. Be an active supporter of the change. Show off those who are leaders and who sets the example for others to follow.

Measure current levels. Look at the data again.

Reapply pressure to action points. Adjust the application as needed.

Check for output. What indications are present now?

Keep buy-in. Open processes change as new knowledge and insight is gained, so they should never remain static for long; be cautious when they do. Always seek new ideas, and a different perspective. Resist the status quo and the routine.

Application of this practice guideline is a natural extension of assessment in that the end goal is the beginning of the process of change. Application is simply beginning with the end in mind, determining feedback that self-regulates and moves individuals and organizations, identifying and checking standards of measures, designing a comprehensive plan that addresses all of the action points that need attention, and measuring progress toward the goal. If an organizational vision is articulated by leadership, and staff are involved in setting goals, and all are motivated by their values, provided the tools and appropriate levels of feedback, then they will reach the goal.

METHOD

Study Objective

The purpose of this two-phase study was to evaluate the effectiveness of the Interdisciplinary Patient Safety Practice Guideline for Restraint Reduction and Fall Prevention in medical, behavioral health, and long-term care settings. The Systems Theory-based Interdisciplinary Patient Safety Practice Guideline for Restraint Reduction and Fall Prevention is an effective method to improve patient safety by creating learning organizations, improving process management and resulting in outcomes measures moving toward a stable process with low common cause variation and reduced process average in a variety of healthcare settings.

Subject Samples and Settings

The student researcher from a convenience sample of in-state healthcare systems selected the training sites. Initial contact was made by telephone (according the telephone script provided) with a representative from their quality assurance/improvement office. A follow-up meeting was set to present the research study and coordinate details. Total numbers of participants in Phase I – System Learning and Change, of the study will be limited to 150, divided between three care sites and dependent on system needs and resources. Based on a systems theory review of a healthcare organization's needs and resources, a leadership member of that participating system in cooperation with the student

researcher determined their level of participation in the training program by selecting an individual unit from a physically larger system (ex. hospital) or a limited number of staff from a smaller system (ex. long-term care facility). After the participating healthcare organization Institution Review Board (if applicable) approved the finalized Western Michigan University Human Subjects Institution Review Board (WMU HSIRB) application a letter of participation was obtained from the participating organization and provided to the WMU HSIRB office. A training schedule was set and made available to all participants within the organization; direct-care staff (nursing, physicians, social work, therapies) who create and provide a safe care environment, and indirect-care staff (unit coordinators and managers/leaders, team leaders, purchasing agents, quality assurance, safety manager and safety team members, and hospital leadership), who are responsible for developing, creating, supporting and promoting safe care environments within their healthcare system. The participants of Phase I - System Learning and Change came from various levels and roles within the participating healthcare organization. No control group was utilized. Phase II – System Outcomes the participating sites provided restraint and falls trend data for analysis as appropriate.

The investigator's relationship with subjects during Phase I – System Learning and Change was limited to providing the on-site training. During Phase II – System Outcomes, however, the student researcher was completely objective regarding the collection and analysis of outcomes restraint and falls occurrence reporting data provided by the participating healthcare setting.

Procedure

As indicated, this was a two-phase quantitative nonexperimental evaluation research design intended to determine the effectiveness of the Interdisciplinary Patient Safety Practice Guideline for Restraint Reduction and Fall Prevention (independent variable) in medical, behavioral healthcare, and long-term care settings. This practice guideline explicates the system, subsystem and component relationships of a healthcare system that impact restraint reduction and fall prevention and in addition may have the potential to be generalized to other patient safety processes. Phase I – System Learning and Change consisted of the implementation of a training program based on the student researcher's practice guideline and collection of pre-test and post-test data to measure individual and system learning based on participant awareness, knowledge, attitudes and skills regarding the application of system theory to restraint reduction and fall prevention. Phase II – System Outcomes of the study was the analysis of restraint and falls trend data that the organization collected in accordance with their governing standards or regulations.

The participating healthcare settings were expected to participate in both Phase I and Phase II of the pilot study. During Phase I – System Learning and Change, direct and indirect staff of the participating healthcare setting agreed to participate in a one-day 8-hour or a two consecutive day, 4-hour training program on the Systems Theory based Interdisciplinary Patient Safety Practice Guideline on Restraint Reduction and Fall Prevention. The participating healthcare leadership choose between the one-day or two-day training program based on

their staff resources. The participating healthcare settings leadership determined participation of employees in the training program.

Each healthcare setting employee (staff and leaders) participating in the training were asked to complete an anonymous pre-test and post-test to determine system knowledge, attitudes and skills related to restraint reduction and fall prevention, and ability to identify and utilize systems theory concepts. The individual employee may determine whether or not to release their pre-test and post-test information for the research study.

Each healthcare system will be expected to report appropriate restraint and fall occurrence data in accordance with their governing standards/regulations for up to three months *prior to and after* the training to include at a minimum: 1) hours of restraint per month, 2) number of patients restrained per month, 3) circumstances for restraint use, 4) fall rates (number of falls and number of patients falling), and 5) circumstances for falls.

There was no manipulation of the independent variable (practice guideline training program) as training was provided in the same manner at each of the care settings. Phase I – System Learning and Change pre-test and post-test (structured surveys) training participant data was used to measure the degree of dependent variability in individual and system learning based on participant awareness, knowledge, attitudes and skills regarding the application of system theory to restraint reduction and fall prevention processes and the relationship to process management and outcomes after program implementation. Phase II – System Outcomes data provided a measure for the degree of dependent

variability in system outcomes as a result of implementation of the practice guideline.

Phase I – System Learning and Change controls were that the participating healthcare setting agreed to participate in a one-day 8-hour or a two consecutive day 4-hour training program. The practice guideline and resulting training program was developed by the student researcher and was presented in its entirety in the same manner and with the same content to each of the three participating care settings. Additional training outside of the initial scheduled training(s) was not provided during the period of the study. There are no known controls for Phase II – System Outcomes for this study as implementation is dependent on the individual healthcare system.

Phase I – System Learning and Change instruments and tools consisted of a 15-question tool was designed by the student researcher as the pre-test and post-test to measure the degree of dependent variability in individual and system learning based on participant awareness, knowledge, attitudes and skills regarding the application of system theory to restraint reduction and fall prevention processes (See appendix C).

The location of the study was within the physical structure(s) of the participating medical, behavioral health, and long-term care settings. The duration of the study was predetermined by the participating system and student researcher and limited according to the length of time required to perform training at any one medical, behavioral health or long-term care site and collect outcomes data.

Data Analysis is to determine the effectiveness of this practice guideline in all three care settings. Therefore, descriptive statistics were used to describe the three geographically separate and unique subject sample sites: medical, behavioral, and long-term care. Phase I - System Learning and Change provided summative enumerative data from the pre and post-test collected during the training to identify the characteristics of a finite population's data distribution; central tendency of restraint usage and fall occurrence; variability in individual and organizational boundary awareness, knowledge, attitudes, and skill from which it may be possible to establish probability as to the level of function-dysfunction in the organization's ability to learn and determine if it is open versus closed; and, use methods for skewness and kurtosis to provide equality in the distribution. Outliers to data were examined for the information they provide from the pre and post-test, and the patterns to any missing data. Two-tailed test of significance were used to determine the probability of function-dysfunction along the continuum. Phase II – System Outcomes data were used as outcomes measures of processes that are infinite and were used to identify the effects of a process change. Analytical data can identify common and special cause variation in a process such as shifts, trends or patterns as a result of the practice guideline implementation.

The total picture of the organization through the data collection can be used to estimate the organizations point on the practice guideline's function-dysfunction continuum, and the probability of meeting objective systems theory

perspective goals for the patient safety issues of restraint reduction and fall prevention.

RESULTS

Phase I – System Learning and Change

There were fifty-three training participants from three participating care sites, a critical care unit and behavioral health unit within the same healthcare system, and a long-term care facility. Thirty-six training participants; eight from critical care, seven from behavioral health, and 21 from long-term care completed both a pre and post-test for use in the study (see Appendix C). If a training participant released the pre-test for use but not the post-test or vice-versa neither were used.

The pre and post-test were duplicates and designed to elicit quantitative and qualitative responses regarding a number of areas pertinent to the application of systems theory to restraint reduction and fall prevention. The intent of the quantitative questions one through six (see Table 1) was to identify participant and organizational boundary awareness and permeability, subject knowledge, desire to learn, skills, and perception regarding decision-making abilities to reduce restraint and prevent falls. Questions seven through twelve are qualitative and are designed to allow the opportunity to expand on previous questions, identify a change in the individual's perspective and potential performance output, and focus on unit-specific system attributes.

Overall Pre and Post-Test Responses

When participants were asked on pre-test about their receptiveness to outside ideas as a measure their degree of openness, most respondents (71.4%)

indicated they were very receptive while the remainder (28.6%) were somewhat receptive. This only changed slightly on post-test scores reflecting most (72.7%) were very receptive and the remainder (27.3%) was somewhat receptive. However, scores were somewhat different dependent on setting. By contrast, when asked if they were a learning organization on pre-test most (97.2%) indicated yes, while the remainder (2.8%) responded no. Post-test scores reflected that all (100%) of respondents agreed they worked in learning organizations. When participants were questioned on pre-test regarding the ability of restraints to prevent falls the majority (71.4%) indicated no, while the minority (28.6%) of respondents indicated yes. On post-test more (88.9%) participants believed restraints do not prevent falls and fewer (11.1%) continued to believe do prevent falls. When participants were questioned regarding their desire to learn new methods to reduce restraint and prevent falls, again all (100%) responded yes on pre-test. Most respondents (55.6%) on pre-test believed their skills to reduce restraint and prevent falls was good and the minority (44.4%) fair; on post-test a larger majority (66.6%) said their skills were good and the remainder (31.4%) said they were fair. Question six asked about their ability to make decisions to reduce restraint and prevent falls and most (61.1%) indicated they were enabled; that percentage increased (82.4%) on the post-test. Overall no one responded that they were unable to make decisions regarding restraint reduction and fall prevention efforts.

Site A: Critical Care Unit

Most critical care staff (87.5%) was receptive to new ideas to reduce restraint and prevent falls. When asked on pre-test if restraints prevent falls the majority (75%) indicated no, but that number increased dramatically (100%) on post-test. All participants identified a desire to learn new methods to reduce restraint and prevent falls. When asked about their skills to reduce restraint and prevent falls most (62.5%) critical care staff indicated they were good; again this number increased (100%) good on the post-test. Acute care staff was asked about their ability to make decisions to reduce restraint and prevent falls. The majority (75%) of pre-test respondents indicated they were somewhat able to make decisions, while the remainder (25%) felt enabled. After the intervention most respondents (87.5%) felt enabled to reduce restraint and prevent falls and only the minority (12.5%) were somewhat able.

When asked about contributing factors to falls in their unit staff identified two themes as primary contributors on both pre and post-test; 1) patient confusion/altered mental status, and 2) impaired performance skills. They also believe that these factors contributed to the use of restraint on pre-test. Factors contributing to the use of restraint on post-test were a lack of creative thinking, decreased alternatives and doing what is easiest for the caregiver. When staff took action to prevent falls they indicated on pre-test the use of a variety of appropriate less restrictive alternatives such as; 1) family visitations and sitters, 2) organizing the room, 3) bed alarms, 4) frequent checks, 5) sitting the patient at the nurse's station, and 6) diversional activities. They also indicated the use of

side rails and restraints as needed to prevent falls. On the post-test, new themes emerged as methods to prevent a fall such as educating the patient, orientation, discovering family history, and more alternatives were identified. When they identified what changes needed to be made on pre-test they clearly indicated a need for increased awareness of alternatives. On post-test they indicated the need for more education and a focus on the overall treatment goal. Pre-test examples of staff communication used included; 1) shift report, 2) meetings, 3) direct one-to-one with another staff member, and 4) documentation. Post-test responses regarding communication included those same themes but added the use of newsletters, education, and card systems to pass on pertinent information. On pre-test when asked how feedback is used to reduce restraint and prevent falls, responses varied. However, one response stood out: "share data on falls and learn from experience". Responses on the post-test were significantly different and include some suggestions such as: encourage people to think of and try new ideas, teamwork with the family, getting to know the patient, passing on information about the patient to others, and sharing what works and what does not work. Pre-test responses for restraint alternatives or fall prevention techniques were limited in contrast to the post-test responses, which were more comprehensive (see Table 2).

Site B: Older Adult Behavioral Health Unit

Behavioral health staff receptiveness to new ideas on the pre-test indicated the minority (42.9%) was very receptive and the remainder was somewhat receptive. However in contrast, all (100%) of the respondents

indicated they were a learning organization. When asked if restraints prevent falls most (66.7%) indicated no, but that number rose considerably (85.7%) on post-test. All participants identified a desire to learn new methods to reduce restraint and prevent falls. When behavioral healthcare staff were asked about their skills to reduce restraint and prevent falls most (85.7%) indicated they were good on the pre-test, but declined (66.7%) on the post-test. Behavioral health staff were asked about their ability to make decisions to reduce restraint and prevent falls and indicated most (85.7%) were enabled and few (14.3%) were somewhat able on pre-test. Again, the number of staff who felt enabled (71.4%) decreased on post-test.

On pre-test when asked about contributing factors to falls in their unit their responses were similar to those of the long-term care facility. They identified two primary issues; 1) patient based: impaired cognition, motor skills, insight, and judgment that resulted in unsafe behaviors, and 2) staff based: lack of staff buy-in, lack of responsibility, inconsistent attention and response to resident needs. On post-test staff identified all of the previous responses and added the environment as a causative reason for falls. When asked what contributes to restraint use in their unit, answers varied widely but remained the same from pre-test to post-test. These included: not used, used for falling out of bed, used rarely if ever, uncontrolled behavior, lack of staff, and they have not been used for the past year. The actions taken to prevent falls on pre-test included monitoring and supervision with a heavy reliance on alarms. Post-test responses indicated the same answers in addition to the use of activities; redirection; and to assess

physical, behavior, cognitive, and environmental aspects. When asked on the pre-test what needed to change they identified a need for more staff and new ideas. Post-test responses included more awareness of patient needs, teamwork, and better communication with other staff, patient and family. Communication examples on pre-test were the same as those for the critical care setting. On post-test staff reported the same communication examples with the addition of validation therapy. Responses to the question regarding the use of feedback were mixed, however two respondents were unique; 1) communicating patient needs and good assessment skills, and 2) open lines of communication, looking at records for fall histories to determine what changes could be made. On post-test feedback was identified as useful to improve knowledge, change current practices, improve understanding, and sharing information to better understand the patient. Pre-test responses for restraint alternative or fall prevention techniques were more comprehensive as compared to post-test responses (see Table 2).

Site C: Long-Term Care Facility

Long-term care staff receptiveness to new ideas indicated that most (75%) were very receptive and few (25%) were somewhat receptive on the pre-test. A slight increase (77.8%) was reported on the post-test. When asked if restraints prevent falls long-term care respondents (28.6%) indicated yes, however most (71.4%) indicated no on pre-test. The percentage of no responses rose (85.7%) on post-test. All participants identified a desire to learn new methods to reduce

restraint and prevent falls. When long-term care staff were asked about their skills to reduce restraint and prevent falls the minority (42.9%) indicated good on the pre-test, but rose (57.1%) on the post-test. Long-term care staff were asked about their ability to make decisions to reduce restraint and prevent falls most (66.7%) were enabled and that percentage rose (84.2%) on post-test.

When asked to identify contributors to falls in their facility, the following themes emerged on pre-test; 1) Impaired cognition, insight, and judgment resulted in impaired resident abilities to follow safety precautions and demonstrate the proper use of assistive devices, and 2) Staffing issues related to a lack of staff buy-in and acceptance of responsibility to prevent falls by providing inconsistent attention and response to resident needs. On post-test the predominant theme was caregiver communication as the number one contributor to falls, then followed by the contributors identified on pre-test. Staff identified one main contributor to the use of restraint in their facility on pre-test: the desire to protect residents from self-injury due to impaired cognition and resulting behaviors. However, there was also some confusion in their answers regarding the use of restraint. Some respondents stated restraints were not used, some identified the use of side rails, and others identified restraint use for staff convenience. On post-test the contributors to restraint use in order of those most frequently identified were: 1) falls, 2) caregiver communication, 3) staff and resident education, and 4) management of behaviors. Some confusion as to whether restraint was used at all remained but seemed to be overshadowed by the new themes. When asked what actions are taken to prevent falls,

respondents identified the following on pre-test; 1) monitoring resident behaviors, i.e. needs and movement and providing activities to divert attention, 2) use of devices to monitor, 3) resident orientation, and 4) staff education. On post-test responses regarding actions to take to prevent falls included; 1) communication, 2) monitoring the resident, 3) brainstorming solutions with co-workers and families, 4) look for the real reasons for falls, and 5) anticipant resident needs. Staff identified the following changes that need to be made 1) increase awareness and involvement of all staff to be more responsive to resident needs, i.e. responding to call lights, being proactive and prevention education. On post-test when asked what changes need to be made, three themes emerged: 1) caregiver communication, 2) participation on all levels, and 3) planning and teamwork. The following were examples of communication on the pre-test: 1) documentation, 2) meetings, 3) in-services, 4) report, and 5) resident communication. Post-test examples of communication were very different and included pre-test themes and 1) rewards, 2) asking opinions, 3) identification of potential solutions and effectiveness, 4) written guidelines, 5) brainstorming, and 6) safety meetings. The use of feedback on the pre-test was to 1) share what works and what does not, 2) to prevent incident reoccurrence, and 3) seek involvement to discover ideas in caring for the resident. On the post-test two themes were clear 1) communicate assessment findings to inform others what needs to be done, and 2) to discover what is working and what is not. The pre-test and post-test responses for restraint alternative or fall prevention techniques

were comprehensive. Many responses on the pre-test did not repeat on the post-test. However, many new ideas from the training were mentioned (see Table 2).

Table 1. Paired t-tests on combined training participant responses for pre and post-test questions 1 through 6

	Pre and Post-Test
1. When presented with a new practice model by someone outside my unit/organization I am: very receptive, somewhat receptive, or not at all receptive?	n=33 Pre & Post Test Mean = 1.27 (Std. Deviation = .452) t-test = .000 Sig. (2-tailed) = 1.000
2. Do you consider your unit/organization a learning organization: yes or no?	n=35 Pre-Test Mean = 1.03 (Std. Deviation = .169) Post-Test Mean = 1.00 (Std. Deviation = .000) t-test = 1.000 Sig. (2-tailed) = .324
3. Do restraints prevent falls: yes or no?	n=35 Pre-Test Mean = 1.71 (Std. Deviation = .458) Post-Test Mean = 1.89 (Std. Deviation = .323) t-test = -2.240 *Sig. (2-tailed) = .032
4. Do you desire to learn new methods to reduce restraint use: yes or no?	n=36 Pre-Test Mean = 1.00 (Std. Deviation = .000) Post-Test Mean = 1.03 (Std. Deviation = .167) t-test = -1.000 Sig. (2-tailed) = .324
5. Would you say your skills to reduce restraint and prevent falls are: good, fair, or poor?	n=35 Pre-Test Mean = 1.46 (Std. Deviation = .505) Post-Test Mean = 1.31 (Std. Deviation = .471) t-test = 1.537 Sig. (2-tailed) = .134
6. What word best describes your perception of decision-making abilities to reduce restraint and prevent falls: enabled, somewhat able, or unable?	n=34 Pre-Test Mean = 1.38 (Std. Deviation = .493) Post-Test Mean = 1.18 (Std. Deviation = .387) t-test = 2.028 Sig. (2-tailed) = .051

*sig. <=.05.

Table 2. Pre and Post-test qualitative responses to question 15

Pre-Test: Appropriate Restraint Alternatives and Fall Prevention Methods	Post-Test: Appropriate Restraint Alternatives and Fall Prevention Methods
CRITICAL CARE UNIT Sitters, one-to-one, family involvement, medication adjustment, quiet atmosphere, bed alarms, diversions, sit patient at nurse's station, music, increase positional comfort.	**CRITICAL CARE UNIT** Sitters, one-to-one, family involvement, medication adjustment, quiet atmosphere, bed alarms, diversions (television, video games, activity aprons, magazines), sit patient at nurse's station, music, increase positional comfort with postural devices like drop seats and lap devices, self-release seat belts, pain relief, chaplains, lighting, talking to patient, keeping call light in reach, change arrangement of room, a change of environment/scenery, long sleeve shirts to prevent picking at IV sites or hiding sites with stockings and IV covers, color schemes of environment, educating the patient, keep everything in reach of the patient.
OLDER ADULT BEHAVIORAL HEALTH UNIT Toileting Q2hrs, verbal and non-verbal communication, diversions, one-to-one supervision, family involvement, meeting physiological needs, medication adjustment, fall alarms, pressure relief, lighting, use of glasses and hearing aids, sensory stimulation, orientation, room placement, good assessment, "penalties for staff lack of attention", establishing rapport with patient, increased awareness of patient needs.	**OLDER ADULT BEHAVIORAL HEALTH UNIT** Room safety checks, assess positioning, create rapport with patients, observe patients closely, communication with team members.
LONG-TERM CARE FACILITY Physical therapy for strengthening and flexibility, observation, positioning and posture (seat cushions), monitor behaviors, patient lifting devices to prevent falls, identify what predisposes resident for falls, redirection, separate residents when needed, provide wandering areas, staff and resident education, wheelchair and bed alarms, proper wheelchair fit, use of ambulation aides, medication review, occupational therapy evaluation, proper footwear, toileting Q2hrs, spending time to talk to the resident and divert attention, music, self-release belts, half side rails, non-narcotic medications rather than narcotics, floor mats, staff education, low beds, orientation to use of call light, pain control, reminders to ask for assistance, remove clutter (furniture arrangement), good care plans, self-release lap cushions, physician evaluation, management of physiological impairments and needs, changing position, ambulating resident, remove spills, ensure equipment is working properly.	**LONG-TERM CARE FACILITY** Place personal items within reach, call light within reach, non-skid shoes, proper lighting, remove clutter, orient resident, toilet as needed, half side rails, physical therapy evaluation, monitor gait, offer rest breaks, motion alarms, bed rails down, remove spills from floor, self-release belts, one-to-one, ensure equipment is working properly, frequent monitoring, appropriate side rail use, medication review, redirection, diversional activities, wheelchair/walker/commode within reach, proper wheelchair fit, staff education, manage behavior, constant communication with staff, lap devices, special walkers, systems perspective, learn resident history, positioning and posture, acknowledge the person, television and radio, policies and procedures, have a goal and vision, teamwork, family involvement, team member commitment, staff and family education, feedback, trial of various alternatives, look at whole scenario.

Question thirteen asked respondents to rate the importance of restraint use for five situations on a Likert scale of 1 (not important) to 5 (very important). The post-test was significantly skewed according to Fisher's Measure of

Skewness (2.94) with a mean of (14.14) and standard deviation of (7.639). A square root transformation was performed, as it was the most conservative resulting in a measure of skewness at (1.87), a mean score of (3.64), and standard deviation of (.954). A Paired T-Test was performed with the normally distributed pre-test mean and the transformed post-test (n=36) with a (.388) correlation and (.019) significance.

Table 3. Paired t-test after square root transformation of post-test question 13

	Pre-Test	Post-Test
13. Rate the importance of restraint use for the following (5) situations. a. To prevent falls b. To prevent postural instability c. To prevent bed exit d. To prevent interference with medical therapy e. To control disruptive or agitated behavior f. To prevent wandering g. For low staff to patient ratio	Mean 19.42 Std. Deviation 8.735 Std. Error Mean 1.456	Mean 3.64 Std. Deviation .954 Std. Error Mean .159
Paired Samples Test: df=35. Sig. (2-tailed) .000.		

Phase II – System Outcomes

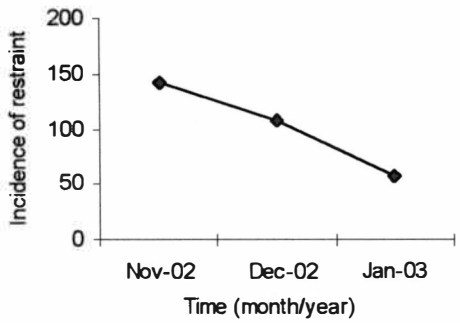
The following outcomes data was provided by each of the three care sites for a one-month period previous to and following the provision of staff training. Data provided by each care site regarding the span of time prior to and following the training differed. As a result, the data for each site was limited to one quarter of a year or a three-month period. The data collected is not intended for comparison against the other sites. The intent of the data collection is to look for possible carryover from Phase One - Learning and Change to Phase Two –

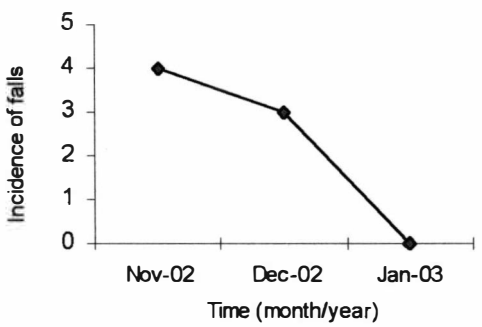
System Outcomes as a special cause variation identified by an immediate pattern or trend shift after the training was provided.

Site A: Critical Care Unit

This is a 20-bed medical unit within a 172-bed multi-campus hospital. Number of patients with critical care days ran between 117 and 129 for the period. Training was provided in one eight-hour session on December 4, 2002 for nine staff members of this unit. Of those nine staff, eight returned both a completed pre and post-test. Most participants (62%) were nurses and nursing assistants and (37.5%) were in leadership or management positions. The trend for restraint occurrence was declining for this unit since October 2002 from 167 incidents to 143 in November 2002. The rate of decline accelerated to 58 incidents after the training was completed. The rate for fall occurrence in October 2002 was 3 and rose to 4 in November 2002. The rate dropped to zero the month following the training.

Table 4. Critical care system output (training intervention on December 4, 2002)

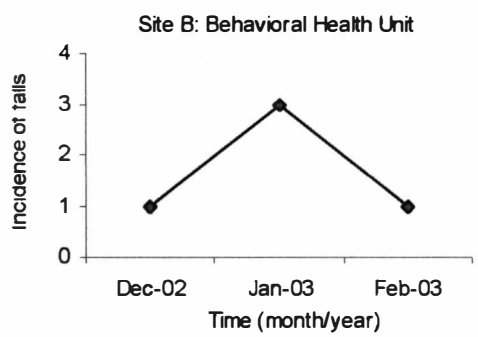




Site B: Older Adult Behavioral Health Unit

This is a 14-bed gero-psychiatric inpatient unit within an 80 bed psychiatric facility that serves patients 65 years of age and older. Average patient census is ten. Typical patient diagnosis is Dementia with mood and thought disorders. Restraint is reportedly not used on this unit. Training was provided in two four-hour sessions. The fist half of the training material was provided on January 10, 2003 and the training was concluded on January 17, 2003. Eighteen participants attended the fist day of the training and completed pre-tests for use in the study. On the second day of training attendance decreased and only seven participants completed and released post-tests. There were eleven questionnaires that could not be used for the study. Most of the participants (85.7%) were mental health technicians and (14.3%) were considered leader/managers. Outcome results indicate a brief increase in the fall rate during the period immediately after the training in January 2003, and then declined again in February 2003. The cause variation is unclear.

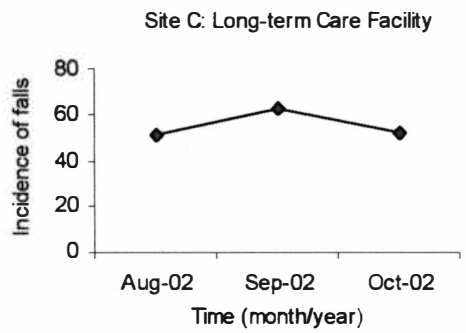
Table 5. Fall incidence output for the older adult behavioral health unit (training intervention January 10 & 17, 2003).



Site C: Long-Term Care Facility

This is a 194-bed long-term medical care facility. Typical patient diagnosis is Alzheimer's Type Dementia with mood and thought disorders. Restraint is reportedly not used at this facility. The pattern of falls (M=62, range 51 to 89) for this facility appears stable since January 2002. The rate of falls decreased to 52 for the month of October 2002 after the training of 26 staff members. Of those who participated, 21 returned completed pre and post-tests. Of those 21, most (52%) were in leadership or management positions; the remainder was a combination of nurses, nursing assistants, and therapists (43%), and support service (5%) personnel. Since the training this facility began a process of developing a long-term strategic plan to decrease falls based on this practice guideline.

Table 6. Fall incidence output for the long-term care facility (training intervention September 24 & 26, 2002).



DISCUSSION

The Systems Theory-based Interdisciplinary Patient Safety Practice Guideline on Restraint Reduction and Fall Prevention is an effective method to improve patient safety in a variety of healthcare settings. This practice guideline provides a framework to change users perspective and provide as Einstein said, "a new level of thinking is required to solve problems" (Thorpe, 2000). The theoretical application of this practice guideline by leaders and managers can provide a framework to enact and guide change. The practical application of systems theory by direct care providers enables them to be creative and "think outside the box", and make decisions that are goal oriented rather than problem focused.

The dynamic relationships that existed at each of the care sites on their receptiveness to new information, perspective on being a learning organization, and desire to learn new methods and the resulting system outputs varied. Both the majority of critical care participants (63% direct care providers) and the majority of long-term care facility participants (52% leader/manager, and 43% direct care providers) consistently identified what appeared to be openness and a desire to learn the model, and both produced and immediate shift in occurrence reporting. The majority of behavioral health unit participants (86% direct care providers) by comparison was somewhat less receptive to new information, however identified they were a learning organization and desired to learn new methods. Their output was different in that the fall rate increased in the same month immediately after the training then decreased the following month.

There were consistently similar problematic themes identified at all three sites that were amenable to the staff education provided by the practice guideline. Patient/resident confusion or altered cognitive functioning and subsequent impairment in skill performance were cited as major reasons for patient/resident falls. Also, It is the patient falling that is cited as the major reason for restraint usage out of a desire to protect the patient. The participants at all care sites identified other contributors; a lack of creative thinking in their processes, a lack of communication in the form of feedback, the need for caregiver responsibility and responsiveness, the need for organizational support, too much focus on what was easiest, and not enough focus on individual patient needs. The American Geriatrics Society and American Association of Geriatric Psychiatry clearly support the need for individualized approaches focused on patient needs, focus on staff *and* patient behaviors that may precipitate restraint, and the discovery of viable alternatives.

Mion (2001) reported staff education focused on syndromes that lead to restraint and encouraged the use of a list of syndrome-specific interventions supported by consultative feedback, but demonstrated mixed results in critical care. All sites including critical care staff, in this study clearly demonstrated a need for creative thinking. It is necessary to share intervention ideas as critical care staff in this study demonstrated a limited repertoire, however it is more important they be able to think flexibly and change their thought processes to develop many personalized solutions rather then the diagnostic norm. It is the uniqueness of individual persons and meeting them in their life contexts that

should be our focus for intervention (Occupational Therapy Practice Framework, 2002). As a result, the application of interventions in complex systems is a dynamic process that changes rapidly for which analytical thinking is too restrictive despite the feedback. Solutions from an analytical perspective are still the same no matter how much you reprocess the information.

The need for supportive feedback was evident from the respondents in this study. Interestingly, Mion (2001) identified moderate to strong Spearman correlations between the support and leadership provided and the listed strategies. This finding supports the notion that evident leadership and support can foster and encourage change by contributing to an atmosphere of organizational teamwork. Participant feedback indicated the desire for more leadership support. Direct care providers are concerned about the safety of their patients and leadership support is critical to enabling a change in the process of restraint reduction and fall prevention. Organizational teamwork is a component of the Organization-Environment Subsystem existing in every healthcare system and can be a powerful action point to promote creativeness and enthusiasm in new processes.

Communication in terms of feedback to support change is a key component of the Organization-Environment Subsystem and any successful new process. Communication either contributes to understanding and support thereby reducing entropy or when it is not utilized well can contribute to organizational chaos. Seeking the direct care providers ideas, input and participation is critical in developing practical restraint alternatives and fall prevention techniques or

approaches that will work in a given setting and population. The findings of this study validate the usefulness of partnering with the staff in an organization and the customers they serve by communicating with them. It is likely the degree of effective communication through feedback among staff correlates with the effectiveness of restraint reduction and fall prevention efforts more than any other single system component. When communication breaks down in an organization lessons learned or best practices have limited chance of success.

The Interdisciplinary Patient Safety Practice Guideline on Restraint Reduction and Fall Prevention increased in all settings participant skills, enabled staff to make decisions, increased knowledge regarding restraints and falls, improved their understanding of communication, the need for teamwork, and openness toward education and creative thinking.

Study Limitations

Healthcare systems, like those who work in them, are living entities that evolve over time in response to various interdependent relationships between resources and demands, and changes in subsystems and components. Each system and subsequent subsystems are different and contain vast potentiality for change or non-change. This study examined the impact of a portion of that potential with an approach that promotes the consideration of entire systems and the use of creative solution finding in order to affect change in different healthcare settings.

The objective relationship between practice guideline author/investigator and subject was limited as much as possible during the training provided in Phase I – System Learning and Change. The pre and post-test (Phase I) contained both quantitative and qualitative questions that have inherently different emphasis in terms of investigator/subject relationship (Bailey, 1991). While the relationship between the investigator and the subjects of the training was mostly detached, it is also recognized and expected that the subjects were likely influenced during the training. It is therefore recommended that the study be duplicated in a manner that reduces investigator bias toward the practice guideline.

Change is dependent on time and can be observed with output both in terms of meeting stated goals and stabilization of processes over a greater period than three months. It is acknowledged that this brief period may not be an adequate representation of the long-term organizational output as a result of this practice guideline. Limited data collection on a short-term basis may not provide an appropriate reflection of the full extent of change or non-change and will need to be examined on a long-term basis. Reducing restraint and preventing falls requires a long-term organizational approach to change (Tideiksaar, 2002). Therefore, it may be necessary in the future to perform a retrospective study with the participating healthcare systems to determine if a pattern change occurred with outcomes data and/or program implementation.

The sample size was relatively small and lacked sufficient power for thorough analysis of the critical care and behavioral care site quantitative

responses regarding the importance of restraint for various situations. However, the qualitative findings added validity to the quantitative responses. All of the staff of a given unit needs to be incorporated into the change for it to have maximum impact. It is recommended that the study be duplicated within a single healthcare system over a greater period of time in order to improve the accuracy of associating this training as a special cause variation.

Conclusion

Patient safety is a healthcare imperative and the need for functional and effective theory-based guidelines for practice cannot be overstated. Medical errors and patient injuries rightfully capture the public's attention that in turn expects accountability. Healthcare providers cannot afford to take unreasonable amounts of time to find solutions to complex safety needs. There is a pressing need for tools that enable providers to be flexible, creative and proactive in an ever-changing medical landscape. The transformation of theory principles provides adequate construct for the application of potential solutions (Mosey, 1996). Systems theory in scope is broad enough to embrace the complexity of patient safety challenges and can be applied irrespective of the components involved (Von Bertalanffy, 1968) and contains vast potential guide leaders and facilitates a change in practice paradigm in direct care providers.

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Appendix A

Human Subjects Institutional Review Board Protocol Approval

WESTERN MICHIGAN UNIVERSITY

Human Subjects Institutional Review Board

Centennial
1903-2003 Celebration

Date: September 9, 2002

To: Ben Atchison, Principal Investigator
Steven Eberth, Student Investigator for thesis

From: Mary Lagerwey, Chair Mary Lagerwey

Re: HSIRB Project Number: 02-08-08

This letter will serve as confirmation that your research project entitled "Evaluation of the Systems Theory Based Interdisciplinary Patient Safety Practice Guideline for Restraint Reduction and Fall Prevention" has been **approved** under the **expedited** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may **only** conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: September 9, 2003

Walwood Hall, Kalamazoo MI 49008-5456
PHONE: (616) 387-8293 FAX: (616) 387-8276

Appendix B

The A-B-C-D Systems Thinking Diagram Adapted for Restraint Reduction and Fall Prevention

Project Title: _____ **Review Date:** _____

(C) The present situation or patient. (Analytical based)
Analytical thinking begins here.

- Where are you right now?
- What are today's issues and problems?
- Failure Modes Effects Analysis Data
- Root Cause Analysis
- Cause Enumeration Diagrams
- What are the problematic behaviors?
- What frustrates you when providing services?
- What prevents change and growth?
- What stands in the way?
- What action is underway?

(D) The system levers for action and change in the organization or patient. (Action or treatment plan implementation)
Program or patient treatment begins here.

- What action will you take to move from the present to the future?
- What component action points in the system are the focuses of change?
  - **Vision & Goal,**
  - **Physical & Non-physical Environment,**
  - **Communication & Control,**
  - **Policy Procedures & Routines,**
  - **Organizational Teamwork,**
  - **Restraint,**
  - **Education,**
  - **Restraint Alternatives,**
  - **Behaviors,**
  - **Family Participation**
- What treatment approach will you use?
- What model of care will you use?
- What therapy will you use?

(A) The future state of the organization or patient outcome. (Outcomes based)
Systems theory application begins here.

- Participative based for the individuals domain of control in the organization or patient.
- Where do we want to be? (What is your vision or dream for your services?)
- What is your purpose? (Consider what would be lost if your organization and services did not exist)
- What are the goals we seek to achieve?
- What are the expected outcomes for this project of intervention?

(B) The feedback in the system. (Evidence based) *Communication is the critical key here.*

- How will you know you have reached your goals and objectives for the organization or patient?
- What objective information can you look for in the organization/system or the patient that will provide evidence that progress is being made?
- Look for the evidence in the three subsystems and components. (see Figure 1.)
- What positive feedback of progress exists?
- What negative feedback of progress exists?
- Is there action being taken or change occurring?
- Is no action being taken or no change occurring?
- Has the process (organizational or patient) stabilized and is it flexible?

Application of the A-B-C-D Systems Model, Haines (1998).

Appendix C

Pre and Post-Test

Participant # (assigned by program instructor) _____

Training Participant Pre and Post-Test

This tool was designed to measure your restraint reduction and fall prevention awareness, knowledge, attitude, and skills to identify and interpret findings and potential system related changes. All of your answers will be kept strictly confidential, because there is no identifying information. These forms will only be seen by the researchers for this study with your permission and will be kept in a locked file in the principle investigators office for at least 3 years.

☐ ***Check this box if you agree to the following: My answers to this test may be used as research data.***

1. When presented with a new practice model by someone outside my unit/organization I am:

A. Very receptive B. Somewhat receptive C. Not at all receptive

2. Do you consider your unit/organization a learning organization? ..... Yes or No

3. Do restraints prevent falls? ..... Yes or No

4. Do you desire to learn new methods to reduce restraint use and prevent falls? ..... Yes or No

5. Would you say your skills to reduce restraint and prevent falls are (circle one): Good Fair Poor

6. What word best describes your perception of decision-making abilities to reduce restraint and prevent falls?

A. Enabled B. Somewhat able C. Unable

7. What contributes to falls in your unit? _____

_____

8. What contributes to restraint use in your unit? _____

_____

9. What do you do to prevent patient falls? _____

_____

10. What changes, if any, need to be made in your unit to improve patient safety? _____

_____

11. What examples of communication are used in your organization? _____

_____

12. How is feedback used to reduce restraint or prevent falls? _____

_____

13. Rate the **importance of restraint use** for the following situations using this scale.

1 – Not Important, 2 – Little Importance, 3 – Somewhat Important, 4 – Important, 5 – Very Important

Prevent falls	1	2	3	4	5
Prevent postural instability	1	2	3	4	5
Prevent bed exiting	1	2	3	4	5
Prevent interference with medical therapy	1	2	3	4	5
Control disruptive or agitated behavior	1	2	3	4	5
Prevent wandering	1	2	3	4	5
Low staff to patient ratio	1	2	3	4	5

14. What is your primary employment role as defined by Human Resources?

____ Leader/Manager, ____ Support Service, ____ Direct Care Provider

15. List as many alternatives to restraint and fall prevention methods as you can on the back of this questionnaire.

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