

Running head: INSTRUMENT CAPSTONE

Development and evaluation of a surveillance instrument for monitoring and cataloging staff
injuries in a state mental hospital.

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October 19, 2010

Section One

Development and evaluation of a surveillance instrument for monitoring and cataloging staff injuries in a state mental hospital.

Overview

This quality improvement study was designed to: 1) review staff injury documentation instruments of public and private mental health facilities and other hospitals in different geographic areas, 2) develop an instrument to document staff injuries and their context, and 3) test the usability/acceptability and the ability to reliably capture relevant data elements.

Background of Problem

Over 48% of all non-fatal injuries from workplace violence occurred from occupational assaults on health care workers (Bureau of Labor Statistics, 2008). During the past ten years, multiple authors have reviewed the increasing risk of workplace violence and its impact on both the health care provider and patient (Arnetz & Arnetz, 2000; Lipscomb, Silverstein, Slavin, Cody & Jenkin, 2002; Worthington & Franklin, 2001).

In fiscal year 2007 data from the Quality Improvement (QI) department of a state psychiatric hospital in the Maryland Mid-Atlantic region of the United States indicated that there were 277 incidents of assault (Eastern Shore Hospital Center, 2007). Among these, 144 of the assaults were patient-to-patient incidences, and 133 were patient-to-staff assaults. In fiscal year 2008, the number of incidents increased to 306 with 162 patient-to-patient assaults and 144 patient-to-staff assaults.

Challenges and Unknown Issues

This dramatic one-year increase in assaults together with ample evidence from the literature documenting the extent of the problem nationally, suggested that this hospital had an escalating problem with staff assaults. Unfortunately, the data system relied on manual counting

of incident reports, which do not collect the information in a standardized fashion. Consistent definitions together with reliable tracking were needed to improve the facility's tracking of common risk factors for staff assault or injury and assist in the development of preventive measures. Lack of consistent definitions for types of injuries, violence, location of injury on body, and descriptions of context has resulted nearly unusable data. In the investigator's experience, direct care staff avoided completion of incident reports or provide incomplete documentation due to time constraints, confusion over legal ramifications of reporting, and inconsistent definitions.

Current Workers Compensation policy guidelines indicate that reportable injuries are those that result in: death, loss of consciousness, days of lost work time, restricted work activities, medical treatment beyond first aid and injuries requiring emergency room treatment (Ruser, 2008). Furthermore, injuries from assaults were documented using an antiquated and time intensive process involving multiple staff reviewing narrative reports.

Problem

A consistent, valid and reliable instrument for data collection, which could be later adapted to an electronic surveillance and reporting system, was urgently needed to track assault data and descriptive information in a timely manner. The Problem, Implementation, Comparison, and Outcomes (PICO) question was: *Does the development and testing of a Staff Injury Data Collection Instrument (SIDCI) at Eastern Shore Hospital Center improve reliability and standardization of data collection?* This question was chosen after the discovery of an inability to track data on staff injuries because the survey instrument was narrative and without clear definitions.

The purpose of this project was to develop and test a tracking instrument that obtained detailed information regarding staff assaults and injuries in a Maryland psychiatric hospital. The

ultimate objective is to implement the data collection instrument in a statewide system. Such statewide data collection could then be used to develop clearer strategies to prevent assaults and injuries.

Theoretical Framework

The first model chosen for this project was a foundation model (The Haddon Matrix). The second was one that is new and includes theoretical perspectives of the Haddon Matrix (Christoffel & Gallagher, 2006), work stress models, and the National Institute of Safety and Health Work Organization Framework and Perceived Violence Climate (NIOSH 2008). The second model was developed by Lipscomb and McPhaul and explains the multiple factors that influence the caregiving work environment and contribute to workplace violence (McPhaul & Lipscomb, 2004). The Haddon Matrix was developed to evaluate injury epidemiology and has been used recently in workplace violence research (Runyon, 2000). The Theoretical Model of Proposed Workplace Violence Prevention Intervention shows the extensive influence of the safety climate on patient violence and indicates that staff perceptions of both top management and group or unit level supervisory practices will influence safety outcomes. This project utilized the multiple areas of influence that impact the care giving work environment to develop the elements of the data-tracking instrument. The elements were designed to capture necessary data to provide information on areas in need of improvement to increase workplace safety.

Approach

This project developed and tested a tracking instrument that obtained detailed information regarding staff assaults and workplace injuries in a Maryland psychiatric hospital. Steps of the project included: 1) review of other surveillance instruments, 2) development of a new tracking instrument, and, 3) testing the instrument with direct care personnel using

simulated cases to assess usability/acceptability and ability to adequately capture relevant data elements.

Significance and Anticipated Outcomes

This project was developed to provide evidence that a better instrument for data collection regarding staff assaults and injuries can be used by staff and will provide essential data needed to develop strategies to prevent such assaults. Ongoing plans for the project are to then implement a statewide electronic surveillance and reporting system. The final tool will also improve reporting in the test site setting along with accuracy and consistency of data.

Section Two

Literature Review

Search Strategy

The evidence search related to the development of a data collection instrument for workplace injury reporting in a psychiatric hospital involved a systematic review of four different databases that included MEDLINE, PsycINFO, CINAHL, and PubMed . All of the databases used keywords of workplace violence, health care workers, occupational safety, accident report, injury report, workplace injuries, injury surveillance, and psychiatric hospital. Dates of the articles were limited to a ten-year period beginning in 2000. A subsequent update of the literature review took place just prior to completion of this project. The review of the evidence utilizing the Johns Hopkins Nursing Evidenced-based model (Newhouse, Dearholt, Poe, Pugh, & White, 2007) indicated no available evidence focused on violent assault injury tracking or reporting in psychiatric hospitals. However, one case management approach used a controlled trial design with case management as an intervention, but there was no data on actual types of injuries (Walsh, Gilvarry, Samele, Harvey, Manley, & Tyrer, 2001). Arnetz and Arnetz

(2002) did publish a controlled prospective study that ran for one year implementing and evaluating an intervention program that included their Violent Incident Form (VIF) that was developed in 1998. But, this study used a questionnaire and the VIF to examine incidents in acute hospital settings. Moreover, the study focus was on comparison of the groups after an intervention occurred with feedback discussions.

The current Maryland injury reporting system is based on Workers Compensation requirements for data tracking and does not describe the person committing the act, the type of violent act, or descriptions of the weapons if any used. The state of Washington developed laws to not only monitor occurrences but also to determine intent, measure threats, and describe actions taken in response to the act of violence (Washington State Department of Labor & Industries, 1999). Washington reports indicate that psychiatric and substance abuse hospitals have an increase of over 81% in the assault-related workers compensation claims during the period of 2000-2005 (Foley, 2007). It appears that even with state based recording system and new laws, the trend for increased assaults in psychiatric settings continues.

An additional review of the literature took place to focus on the OSHA guidelines, work place violence in general and information regarding assaults in the psychiatric setting. Removal of psychiatric setting provided three hundred and twenty articles. A literature search on injury reporting provided fifty articles within that group but again, none in psychiatric hospitals within the ten-year timeframe. There were no studies found specifically addressing documentation and record keeping instrument development related to injuries as a result of violence toward staff in a psychiatric setting. Furthermore, there were no available randomized control trials utilizing or addressing development of documentation and record keeping instruments related to workplace injuries in psychiatric facilities. Injuries from violence in the selected setting are primarily client on worker violence. Multiple authors have, during the past ten years, reviewed the increasing

risk of workplace violence and its impact on both the health care provider and patient (Arnetz & Arnetz, 2000; Lipscomb, Silverstein, Slavin, Cody & Jenkin, 2002; Worthington & Franklin, 2001). Several of the articles mention accident reporting but none focus on documentation of injuries in a psychiatric setting or on the importance of data collection tool development.

Features of Effective Surveillance Tools

A review and evaluation of the Utah Student Injury Reporting System supports the importance of sensitivity, simplicity, low cost, and ability to monitor trends as the ideal model for an instrument design and evaluation of injury interventions (Spicer, Cazier, Keller & Miller, 2002). The importance of capturing data on the number of injuries of dancers over a given period of time and to whom, when, where, and the outcome of those injuries was the focus of a Liederbach and Richardson (2007) article. Other important information was how and why injuries occurred in addition to review of the time lost or work function lost (Liederbach & Richardson, 2007). This supported the need for clear definitions and the need for accurate data collection. Most injury surveillance systems in the literature have been designed to assist in injury prevention and to prioritize the data for prevention strategies. An injury surveillance system needs to be ongoing and monitored for patterns and trends to provide data for interventions to be developed to prevent injury occurrences. A World Health Organization report in 2002 focused on three concepts of importance in injury prevention: injury prevention through *engineering* safer working and living conditions, through *enforcing* rules and regulations for safer practice and through *educating* continuously (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002).

Definitions

Standardized definitions of injuries due to assaults from patients have not been established. Injuries from the Bureau of Labor Statistics must involve lost work days, whereas injuries for the

OSHA 300 log are the record of data from the Maryland Workers Compensation requirements and must involve medical care more extensive than first aid. Workers compensation reports also typically involve lost work time or medical care since compensation for the time lost and medical care is the primary purpose of the program. Surveillance systems designed to track and prevent injuries must include date, time, injury description, type of injury (fall, assault, etc.), facility location, numbers of days of lost work time, and influencing factors (patient related, environmental factors, etc.) to the injury. The University of Iowa Injury Prevention Research Center defined types of workplace violence in 2001 in a paper on a study in Virginia of *Workplace Violence for Emergency Service Workers and A Workplace Violence Report to the Nation in February 2001* (University of Iowa Injury Prevention Research Center, 2001).

Members of the University of Iowa Injury Prevention Research Center, Peek-Asa, Runyan, and Zwerling (2001) described the four types of workplace violence. Type one is when a criminal act is included in the violence toward an employee, type two is when a customer or client who becomes violent while being served by the health care worker toward that worker and perpetrates violence, type three is worker on worker violence and type four is violence resulting from a personal relationship between the perpetrator and the employee (Peek-Asa, Runyan, & Zwerling, 2001). In 2004 McPhaul and Lipscomb authored a paper that examined Type II workplace violence or that of customer or client against health care worker. (McPhaul & Lipscomb, 2004).

Risk Factors for Workplace Violence in Mental Health Settings

Risk factors for workplace violence in the mental health setting include increased use of hospitals by the criminal justice system for court related assessments and determination of violence or danger, unstable mentally ill persons, poor staffing, poor environmental safety controls such as alarms or overcrowding of patients, and mixing of chronically mental ill persons

with those who have forensic history (Occupational Safety and Health Administration, 1994).

Risk factors for violence occurring in hospitals include: working with volatile people, especially if they have drug use or alcohol history, those with violence history, certain psychotic diagnoses, poor environmental design, inadequate security and staffing, poor staff training on preventing and management of aggressive behaviors, and waiting for services (NIOSH, 2002).

Approaches to Prevention

Before any of programs can be implemented or changed, we must understand the determinants of the injuries that occur within the system. Examination of the numbers of injuries and the causes leading to those injuries must take into account not only personal factors or shortcomings but also environment, lifestyles, violence history, and living conditions. Combinations of medication, behavioral interventions, staff prevention, staff interactions and training and environment appear to have the greatest impact on assault behaviors in the literature. Training programs have been recommended such as the one currently used in Maryland called *Prevention and Management of Assaultive Behaviors* or PMAB. They contain information regarding the assault cycle, de-escalation, communication, patient perceptions, transference and counter-transference, and factors affecting assault behaviors such as illness, anger, environmental limits, and forensic charges.

In the Iowa report to the nation on workplace violence (University of Iowa Injury Prevention Research Center, 2001), prevention approaches included the environmental approach, which focused on lighting, security, and other engineering controls. The programs, policies and workplace practice were the focus of the organizational or administrative approach and staff training and response to violence was included in the behavioral and interpersonal prevention approach. Much discussion in the report focused on lack of adequate research into the three prevention approaches and their effectiveness along with the lack of use of scientific methods in

existing research. The report also commented on lack of federal legislation or regulations addressing prevention of workplace violence. Areas of research needs were identified in the Iowa report however there was no discussion regarding documentation, injury surveillance, or data collection (University of Iowa Injury Prevention Research Center, 2001).

The Models

The Haddon Matrix

The Haddon Matrix was developed to be used to evaluate injury epidemiology in the early 1970's (Haddon, 1972, 1974) and has recently been cited for use in workplace violence research (Runyon, 2000; McPhaul & Lipscomb, 2004). The model is designed to apply public health domains of host, agent, and disease to primary, secondary, and tertiary injury factors. When applied to workplace violence the host is the victim of workplace violence, the agent/vehicle is the patient and their chosen weapon or force that occurs with the assault, the physical environment is the hospital ward or hospital location, and the social environment is the patient interaction, presence of additional staff and supervisor or administrative supports (McPhaul & Lipscomb, 2004). Figure 1 shows an application of the Haddon Matrix to workplace violence research in the psychiatric hospital setting.

Metaparadigm concepts of this theory are not based in nursing theory however it can be applied to nursing's four metaparadigm concepts. The theory addresses environment, patient or host, health via the theory's concept of safety, and interventions to change control or environment could be stated as nursing interventions or those of other disciplines. This is an epidemiological framework that utilizes a matrix to describe the pre-event, event, and post-event as they are related to host, agent, physical environment, and social environment. Prevention strategies can be determined and then classified as behavioral, administrative, or environmental.

Figure 1. The Haddon Matrix applied to Workplace Violence in a Psychiatric Hospital Setting

<i>Phases</i>	<i>Host</i>	<i>Agent</i>	<i>Physical Environment</i>	<i>Social Environment</i>
Pre-Event (Prior to assault)	Education Training Experience Knowledge	History of prior violence, forensic involvement	Objects that could be weapons, weapon, layout of unit.	Avoid patient between staff and doorway; work in pairs, visual contact with other staff.
Event (Assault)	Alarms, mirrors, other staff, de-escalation and escape techniques.	Moving away from patient, getting assistance from other staff, Code Green.	Egress, alarms, phone calls, code called.	Security and code procedures
Post-Event (After assault)	Medical Care/De-briefing, counseling	Legal options to press charges, removal to quiet room, seclusion/restraint, medication	Evaluation of event, review of reports, evaluate physical environment	Staff debriefing, discussion, follow-up by supervisors/administration. Risk Mgmt group review. Monthly Seclusion and Restraint meeting reviews.

Theoretical Model of Proposed Workplace Violence Prevention Intervention



Figure 2. Theoretical Model of Proposed Workplace Violence Prevention Intervention

The Theoretical Model of Workplace Violence Prevention was developed by McPhaul and Lipscomb, (paper in development) and explains the multiple factors that influence the caregiving work environment and contribute to workplace violence. The model, depicted in Figure 2, guides the type of information that must be collected in the injury surveillance tool in order to inform preventative actions. There are multiple areas of influence that impact the care giving work environment. These concepts include patient factors such as diagnosis or violence history, patient safety climate, staff perceived violence climate such as staffing and availability of safety measures, system resources, regulatory environment and workplace violence safety leadership. Patient safety is included to take into account the changes of policy regarding the reduction of seclusion and restraint use. The model focuses on the unit level where care is delivered and recognizes that system level policies and mission influence the units environments of care giving. This model supports the importance of data collection with regard to patient factors such as violence and assault history, use of seclusion and restraint, medication status, patient diagnosis, and other patient issues. Safety climate factors such as location on unit of incidents and time of occurrence, staff perceptions of violence climate with the collection of time of injury and number of available staff on unit, system resources such as available staff and policies on definitions of documentable injuries, and regulatory environment with regard to following both facility and state guidelines for workers compensation and injury documentation.

Patient factors were utilized in instrument development to record occurrences by the same patient and ability to track ongoing violence history. Patient safety climate can be measured in the new instrument by documentation of location or unit of each injury and timeframe along with impact of changes in patient type and mixture for the units. Staff perceived violence climate is impacted by the improved ability to track injuries, improved data collection and communication

to policy makers. The system resources encompass the area of this study with regard to data collection and evaluation. Patient factors and patient safety are both addressing in the development of better tracking instruments to obtain additional information regarding injury occurrences.

Data Supporting Existence of the Problem

The Maryland Psychiatric Hospital Site

In 2003 to 2004 at the proposed study site, changes in political climate and philosophy occurred as a result of media exposure to deaths in juvenile institutions during seclusion and restraint applications. This initially affected federal regulations regarding seclusion and restraint and required reduction of the use of this type of intervention. The State of Maryland chose to focus on reduction of seclusion and restraint use in all of the psychiatric hospitals in 2005. Data from the Quality Improvement database at the hospital indicated an increase in-patient to staff assaults from fiscal year 2005 of thirty-six assaults to fiscal year 2006 and one hundred fifteen assaults. As indicated in Table 1, the one-year increase of 219% in assaults by patient on staff and other patients in our facility was greatly impacted by the change in seclusion and restraint focus with additional data collection. Assault data has continued to be an ongoing issue in the facility (Eastern Shore Hospital Center, 2008). This data was documented using an antiquated and time intensive process involving multiple staff reviewing narrative reports. What is urgently needed is both a standardized way to track each incident and an electronic surveillance and reporting system that can track assaults and descriptive information about each incident.

Table 1. Assault data overview

<i>Fiscal Year</i>	<i>Number of Patient to Staff Assaults</i>
2005	36
2006	115
2007	133
2008	144

In addition to the lack of adequate surveillance and documentation systems, the costs of these injuries are substantial. Costs of assaults incurred in the test site, a Maryland state psychiatric hospital, in fiscal year 2008, include medical care for injuries suffered by patients such as a recent severed tendon and muscle requiring over \$500,000 in repair, therapy and follow-ups. Additional costs are the overtime and staffing shortages necessitated by violence and injury to staff members that prevent them from working, increased costs of one to one behavior management and cost of sending staff with patients to address injuries in emergency rooms, hospitals, to outpatient therapy, or follow-up appointments. The actual dollar amounts for these costs are not currently captured,

Another recent change is the population shift in psychiatric hospitals to include patients with developmental disabilities in addition to mental illness. Implications for nursing are increased injuries to staff, short staffing, trauma to both patients and staff, and increasingly dangerous work environments. The desirable outcomes for this project are to provide better data that track incidents, identify potential influences, and inform interventions designed to decrease

violence. The items in the instrument will provide details necessary to make changes and improve the whole system.

Section Three

Methodology

Setting

The setting for this project was a state psychiatric inpatient hospital on the Eastern Shore of Maryland that is made up of three inpatient units and an Assisted Living Unit.

The hospital has a bed capacity of 75 beds, 60 of which are inpatient psychiatric for adults. Seventy percent of the patient population is forensic or involved with court systems. One of the units is a locked unit for use by patients from jail populations that have a detainer and require further security. One unit is assisted living units with many of the patients go out into the community to daily programs. The other two units are for patients that are not stable enough to be in the community or long-term chronic treatment resistant patients.

Design

The proposed study was conceptualized as a quality improvement project since the initial intent was to improve the documentation of employee injuries and assaults within the study organization and this was initiated regardless of the study. It was a descriptive design utilizing a survey questionnaire. The study was conducted in three phases: 1) Review existing instruments related to staff injury in health care organizations; 2) Development of an instrument to document staff injuries and the context of these injuries; and 3) testing the instrument usability/acceptability as well as identification of data capture.

This type of research has the advantage of allowing flexibility, wide focus, and the ability to obtain quantitative data. Using an instrument that subjects provided answers to identical questions supported the quantitative data description.

Phase 1: Review Existing Instruments

Much of the review of existing instruments had already been completed prior to approval of this project as part of an internal quality improvement process in the study organization. To better explicate the limitations of the current data collection instrument and procedures, a systematic review of procedures was conducted. The researcher, in conjunction with the Health and Safety Building on the internal evaluation of the current forms and procedures, the researcher obtained six to ten injury-reporting forms in total from hospitals and facilities in various states.

Committee of Eastern Shore Hospital Center completed a review of the injury data available. This group consists of the Safety officer, Chief Operations Officer, representative of Quality Improvement department, Infection Control Nurse, and a representative of Nursing Administration. The researcher was added to this committee at her request and with the approval of the Chief Executive Officer. The injury data was examined and issues with definitions and procedures identified.

Table 2. Summary of data collection instruments reviewed

<i>Origin</i>	<i>Purpose</i>	<i>Length</i>	<i>Number of Elements</i>
Eastern Shore Hospital Center Maryland	Employee's Report of Accident	One page	16
Ohio	Workers Compensation Reporting www.ohiodnr.com/Portals/0/hr/forms/ADM4303.pdf	Three pages	28
New York	Workers Compensation Reporting www.wcb.state.ny.us	Six pages	51
New York Bureau of Community Environment Health and Food Protection	Children's Camp Program co.suffolk.ny.us/.../healthservices/php_InjuryReportForm.pdf	Three pages	48
Georgia Department of Human Resources	Central State Hospital Accident and Injury Report http://www.centralstatehospital.org/forms/071101%20A%20and%20I.doc	Two pages	50
University of Alabama at Birmingham	Employee, Student, and Visitor Incident Reporting Form www.healthsafe.uab.edu	One page	22
Thomas B Finan Center Maryland	Employee's Report of Injury	One page for employee	23
State of Pennsylvania	Management of Incidents and Incident Reporting and Risk Management Policy and Procedures	Four pages	88

The instruments reviewed on average had one to three pages with the Pennsylvania containing the longest number at four. All forms but two (Georgia and Pennsylvania) had paragraph descriptions of the incident without detail check boxes or lines. All forms included causation, time of day, person identification data, and time lost. All but the *Camp Program* had data that was collected for Workers Compensation Programs and included time lost. None of the forms appeared to include data collection for minor injuries and they all actually listed that the use was for injuries requiring "more than simple first aid". The number of elements varied widely and the more detailed injury statistics were found on the Pennsylvania forms such as

wound descriptions, body parts affected and larger number of choices regarding which body part was affected.

Ultimately based on the review, the essential components included in the newly developed instrument were identified, clearly defined, and drafted. Examples of some of the components included causation, time of day, unit of occurrence, if patient involved, type of injury, location of injury on body, severity of injury (to include requirement of emergency treatment or somatic hospitalization) and type of assault. Attempts were made to include all injuries even if they were not assault related or did not result in significant treatment other than simple first aid. The instrument was intended to capture data for quality improvement purposes and also the necessary data to record the injuries on an Occupational Safety and Health Administration (OSHA) 300 form. OSHA requires recording work-related injuries that result in death, loss of consciousness, days away from work, restricted work activity or transfer, and medical treatment beyond first-aid. Data recorded on OSHA 300 form includes: date of occurrence; injury description and part of body affected; classification such as death, days away from work; and finally, type of injury or illness sustained (United States Department of Labor Occupational Safety and Health Administration, 2001).

Phase 2: Developing revised instrument

In collaboration with the Health and Safety Committee of Eastern Shore Hospital Center and the Capstone Committee, a new form was developed to collect injury data (Appendix A). As described above, the first stage of developing the *Staff Injury Data Collection Instrument or SIDCI* was to review the literature for any existing tools and to obtain results of the data review from the Health and Safety Committee. The Committee was then tasked with advising the researcher on essential components of the instrument needed to measure injury statistics. Next, items of the questionnaire were developed using the available information from existing injury

tools, the data obtained from record review, and the collaboration with the Capstone Chairperson.

A crucial part of instrument development is the establishment of validity. The construct validity of an instrument is measured on its ability to measure what it designed to measure (Santamaria, Daly, Addicott, & Clayton, 2000; Muller-Staub, Lunney, Odenbreit, Needham, Lavin & Achterberg, 2008). Construct validity can be improved by content validity. Content validity measures the variable of interest and can also be used to measure the appropriate sampling of the content domain of items in a questionnaire. It addresses the match between instrument questions and the content or subject area they are intended to assess. Not only should content validity begin with instrument development but it is also used to define the construct of interest. Defining these traits provides a clearer picture of limitations, dimensions, and components of the subject (Yaghmaie, 2003). Content validity should be determined by expert opinion. This type of validity has existed as part of instrument development since the 1950's (Hatcher & Colton, 2007). Domains include type of injury, characteristics of injury, severity, treatment, body location, unit of occurrence, location within the unit, time of day, date, cause of incident, environmental and safety issues, and physical conditions. Content validity was to be determined by experts and therefore the next step was choosing four to six experts in the field of occupational health and workplace safety.

Expert evaluation

The experts were asked to assess the relevancy of data collection elements to the types of information that are needed to adequately report injuries and to develop strategies to prevent such events. The experts gave opinions about how well the items captured the injury data itself, the context of the injury data, and other relevant details. They also examined readability, format and estimated the time to complete the instrument. A four point scale based on the Content

Validity Index developed by Waltz and Bausell was used that included 1 not relevant, 2 item needs some revision, 3 relevant but needs minor revision, and 4 very relevant (Waltz & Bausell, 1983). The instrument and questionnaires were given to six experts in the field of occupational health or researchers with work in workplace injuries. Four of the experts were female and two male. All six completed their questionnaires (Appendix B) within a four week period and returned them to the by email. The questionnaires were reviewed and all experts agreed that the items should rank as 3 relevant with minor revisions or 4 very relevant. Four of six experts ranked all items as very relevant. Feedback on the instrument included suggestions for type size, additions of needelstick injuries, additions of other to several areas of the tool, adding spitting to type of injury, and correction of typographical errors and phrasing for clarity. Based on feedback from the experts, as well as collaboration with internal experts and Capstone committee, the instrument was then revised as indicated (see Appendix C for final form).

Phase 3: Testing usability/acceptability and capture of relevant data

Experts provided important review of data elements and the form itself in relation to the data that is important to capture for reporting and quality improvement. Using standardized case-based scenarios the next step was to ask the staff to complete the form and answer questions about their experience to evaluate the usability and acceptability of the instrument. The scenarios represented the domains: type of injury, cause of injury, characteristics of injury, severity, treatment, body location, unit of occurrence, location within the unit, time of day, date, cause of incident, environmental and safety issues, and physical conditions and were revised by review of the Quality Improvement office. Other causes of injuries included slips, falls, and movement of patients, equipment failures, needle sticks and environmental causes. Data related to assault injuries included diagnosis of patient, previous history of violence, if occurred during seclusion or restraint, and number of available staff on units.

Sample

The study population consisted of the staff of the facility as represented by incident reports documenting reported injuries. There are 198 nursing personnel (Clinical Nurse Specialist, Nursing Supervisors, Nurse Managers, Charge Nurses, RN, LPN, and CNA), seven maintenance, five social workers, five housekeepers, seven physicians, one nurse practitioner, seven activity therapists, five psychologists, and twenty other support staff for a total of 255 staff. The most likely people to use the instrument on a daily basis are the line staff RN's, LPN's, and CNA's. A feasible sample size is 20-30% of personnel but due to budget and time constraints along with the fact volunteers were used, the researcher hoped to obtain 10% or 19-20 volunteer staff to participate. This was a convenience sampling of staff at the time of implementation of the tool. Attempts were also made to obtain other types of staff for testing and all staff members were asked to volunteer. Volunteer staff members used the Health and Safety Committee developed scenarios to fill out the new data collection instruments.

Thirty-two staff members volunteered to complete this project and test the data collection instrument. All of them (100%) that accepted the forms returned them. Of the thirty-two volunteers, twenty-two identified themselves by work classification and ten did not write their job title in thus providing a sample where 69% identified job identification. Table 3 illustrates the volunteer staff returning the forms by type of job.

Table 3. Position of staff respondents (N=22)

Position	Frequency
Hospital Police	2
Social Worker	1
Activity Therapist	2
Housekeeper	2
Staff Development Secretary	1
Pharmacist	1
Phlebotomist	1
RN Supervisor	1
RN Manager	1
RN Charge	1
RN	5
LPN	3
CNA	1

All of the volunteer staff members filled out the tool using the scenarios provided. As the tools were reviewed, it was apparent that the nursing personnel had the largest completion of data items on the tool followed by the hospital police. These staff members are frequently involved in altercations with patients and have the higher rate of injury exposure evidenced by review of the previous data collection tools over a three-year period.

Testing scenarios

The injury scenarios were devised by the Health and Safety Committee to be utilized with the instrument by staff in order to evaluate its reliability and clarity such as a description of the type of injury occurring (see Appendix D). An example of a one of the scenarios used: *A staff member is walking across the unit from the nurse's station to the day hall to monitor patients and a fight breaks out between two patients. She hears the yelling between the patients and responds to their location. The staff member attempts to break up the fight and is struck by a patient then pushed against the wall. The staff member receives a bruise on her left cheek and her shoulder is dislocated. A code is called and other staff responds to the area, breaks up the fight, and separates the patients into their bedrooms. At the time of the incident there are six staff on the unit and they include 1 RN, 1 LPN, 2 CNA's, and 1 Supervisor. The patient has history of multiple assaults and is a diagnosed schizophrenic. The staff member receives injuries that include a bruise to her arm, a dislocated shoulder, and facial lacerations over her right eye. She is seen by the Nurse Practitioner and treated with basic first aid on site then sent to emergency room for sutures and x-rays. The staff member does not return to work for three days. Personnel Office is notified along with risk management, administration and Worker's Compensation.*

Procedures for instrument testing with staff

The investigator passed out the study packets with directions that asked the volunteer to: 1) use the case studies to complete the new form and then complete the 2) usability survey. Volunteer staff members were approached during report times for each shift, provided education on completion of the forms, and an envelope for surveys to be placed in will be left with an employee to return via mail to the researcher. Volunteers were then asked to not place any names on the forms, to only indicate their employment classification and to return the forms anonymously in the provided envelopes. The investigator was not present in the room during the time of implementation. Instruments had no identifying data about the employee except

classification. Consent was implied by participation in filling out the instrument and survey. The injury reports and surveys were returned to the investigator via locked mailbox to protect the staff identification of those who reply.

Evaluations of instrument usability/acceptability as well as identification of data capture.

Data collection using the new instrument was performed to study data capture. Due to the change in format of the new tool from that of describing the incident in a paragraph form to checking items off, it was expected that additional data would be obtained.

To test usability, surveys of staff are used rather than interview to help maintain anonymity. A simple set of Likert items was developed that assessed usability using two domains (perceived usefulness and perceived ease of use) that are common to computer applications (Perlman, 2009) The Likert Items included 10-15 items listed below:

PERCEIVED USEFULNESS

1. Using the instrument would enable me to complete report more quickly
2. Using the instrument would improve documentation of important data
3. Using the instrument would increase the ability to prevent injuries
4. Using the instrument would help me communicate information about injuries to administration and management
5. Using the instrument will increase awareness of staff safety

PERCEIVED EASE OF USE

6. Using the new instrument was easy for me
7. The instructions were clear and easy to implement
8. The instrument itself was clear
9. The definitions were specific to my workplace
10. Using the new instrument does not take more time than using the old form

In addition to completing Likert items, open-ended questions were used to solicit more details from staff. The following questions were included:

1. What do you think the best thing about the new instrument?
2. What suggestions would you have for improvement?
3. Any other comments are welcome! Do you have further suggestions for improvement of the tool?

Statistical Approach and Findings

The principle research question was: *Does the development and testing of a Staff Injury Data Collection Instrument (SIDCI) at Eastern Shore Hospital Center improve reliability and standardization of data collection?* The answer to that question was determined by both the expert review of the data collection instrument and the staff's perceptions regarding ease of use and usefulness of the tool itself. Descriptive statistics and frequencies were the primary analyses used. Acquisition of consistent data was measured based on the employee's responses to the scenarios and the amount of data captured. The primary focus of this instrument development was the assessment of usability/acceptability by the staff testing the instrument. The means of the Likert scale items were reported in scale format indicating means for each question and standard deviations (see Table 4).

Table 4. Staff instrument survey questions

	N	Mean (SD)
Perceived Usefulness		
1 Using the instrument would enable me to complete report more quickly	32	3.69 (1.18)
2 Using the instrument would improve documentation of important data	32	3.81 (1.06)
3 Using the instrument would increase the ability to prevent injuries	32	2.78 (1.10)
4 Using the instrument would help me communicate information about injuries to administration and management	32	3.88 (1.01)
5 Using the instrument will increase awareness of staff safety	32	3.41 (1.07)
Sum		3.52 (0.95)
Perceived Ease of Use		
1 Using the new instrument was easy for me	32	3.78 (1.13)
2 The instructions were clear and easy to implement	32	3.84 (1.02)
3 The instrument itself was clear	32	3.88 (1.07)
4 The definitions were specific to my workplace	32	3.81 (0.97)
5 Using the new instrument does not take more time than using the old form	32	3.50 (1.16)
Sum		3.78 (0.97)

Note. Likert item score: 1= strongly disagree, 2=disagree, 3 = neither agree or disagree, 4= agree, 5=strongly agree

The outcomes indicated that the highest means were for both using the instrument to communicate with administration and management, and clarity of the instrument (3.88/1.01 and 3.88/1.07). Overall the mean for ease of use was higher than that of perceived usefulness (3.78/0.97 vs. 3.52/0.95). The lowest ranking question results was that of using the instrument

would increase the ability to prevent injuries (2.78/1.10). The rest of the questions had means greater than 3 indicating that in general, the staff felt that the tool was useful and easy to use.

For each of the open-ended questions, responses trends were observed and items were placed into similar groupings. The researcher reviewed the results of the open-ended questions and identified themes. Three open-ended questions were asked of the staff that reviewed the data collection instrument: 1) what do you think the best thing about the new instrument; 2) what suggestions would you have for improvement; and 3) any other comments are welcome, do you have further suggestions for improvement of the tool. Common themes related to the question of the best thing about the new instrument included the quickness of filling out the new tool, simplicity of the tool, and the fact that it offered more detail and choices for injury and other information. One comment stated, “this is easy and idiot proof”. Suggestions for improvements were to “chose a large font size”, “use of bolder print” and separate the reporting sections for supervisor and personnel regarding the injury time lost and notifications. Suggestions unrelated to the instrument included comments made during the education phase of implementation regarding safety on the unit or lack of, a need for staff to work together more, and the need for additional unit staff to improve safety.

Barriers and Limitations

The barriers to this project were staff buy-in, time constraints, staffing shortages, and general attitudes of providers regarding their areas of influence. As a Quality Improvement Project, the researcher had already experienced influenced to develop the instrument and pilot it. Staff were surprisingly willing to volunteer for participation in the survey. It was not an expected response due to past experiences of the researcher regarding learning activities and paperwork. The scenarios chosen did not cover all potential areas of possible injury or events so the form may not have been applicable for all situations.

Data limitations are that the incident reports are not generalized and utilize descriptive narratives for reporting. In general, there was also a lack of clear definitions of severity of injury or what is determined to be an assault. Verbal assaults are not tracked in the system and were also not tracked in the new system. There is no current electronic database or means of recording data from instrument. Not all incidents of injury are reported. Not all the staff identified themselves while participating in this project although representation of different types of workers was good.

Human Subject Concerns

The study was conceptualized as a Quality Assurance or Quality Improvement project that was driven by an internal process need at the test facility. The Institutional Review Board of the University of Maryland, Baltimore was contacted to confirm that this study qualifies as exempt. Permission to implement project on site was obtained in writing from the Chief Executive Officer of the hospital. Data collection did not require specific staff identifiers and the personnel office and the Health and Safety Committee removed staff identifiers prior to data review of existing reports. The pilot reports both old and new had no identifying data except classification, age and gender. Consent was implied by participation and staff received a one-page information and risk/benefit sheet. The instruments were returned to the investigator via inter-facility mail system to protect the staff identification of those who participate. Data was maintained by the researcher in a locked file cabinet in a locked limited access office on site. Reports did not include any staff identifiers except classification of the volunteer staff member.

Section Four

Plans for Translation

Impact of project

This project had economic costs to the investigator, the participants and the organization. Staff time to complete the instrument was limited for each individual but 32 participants' times the thirty minutes to complete each tool would be approximately 16 hours of staff time just to complete the tool. The investigator's time to develop the instrument, distribute the tool/scenarios, compile the data, and develop recommendations was considerable. The estimated number of man-hours for researcher was approximately 300 and those for staff varied with average completion of instrument requiring thirty minutes for those reporting start and stop times during the project. Costs to the organization include copying and paper.

Systems

Systems involved in this research included staff, administration, quality improvement, Health and Safety committee, and Risk committee for the research site. Findings from this research will potentially impact the working conditions and reporting of injuries for over 200 employees in a Maryland state psychiatric hospital. This project will next be moved into the additional development of a final data tool that incorporates the new Workers Compensation data reporting requirements and will eventually impact the State of Maryland incident reporting systems and improving the transparency of data collection.

Dissemination

Plans for dissemination include a report of recommendations to the hospital administration and Health and Safety Committee. Presentation of study results will be provided to general staff at two monthly Grand Rounds meetings to include ideas for improvement and to receive their feedback. The author plans to write a descriptive paper of the study to be submitted to multiple peer reviewed professional journals such as: The International Association of Forensic Nurses Journal, Psychiatry & Clinical Neurosciences Journal, and Injury Prevention Journal.

Translation

Obtaining buy-in from administration regarding results and then further testing of the instrument in live cases will be recommended with further development for facility use. A revision of the instrument to include Workers Compensation reporting requirements is to be completed by November 2010. Additional reporting to the statewide Health and Safety Committee will be provided and plans to develop the instrument for statewide use will be explored. Obtaining support from other stakeholders such as the hospital Chief Executive Officers is necessary to implement the instrument across all the state facilities. Approaches will include presentations for the state Medical Directors and other administrative meetings to encourage transparency of data and data sharing. Additional presentation and projects that are currently scheduled that are related to this study include a presentation of the impact of workplace violence and injury as impacted by Healthcare Reform on October 8, 2010, and an evaluation and update of the Violence Policy and Plan at the test hospital to be completed between November and December 2010.

Section Five

Recommendations and Discussion

Expansion of the study to using statewide and specific hospital incident data for the last two to three years is possible. However, each hospital collects its own data and there are limits to access along with problems of definitions of what assault is. None of the other psychiatric hospitals in Maryland currently utilize the electronic medical record and subsequent reporting system of ESHC.

The practice question listed above and the evidence review have led us to several options for further study. Data transparency is necessary to examine the relationship of workplace

injuries to the environment, education, and other factors in the facilities. The lack of a consistent way of capturing the injury data provides a large number of opportunities for further study. A possible long-term option is to develop an electronic database system to increase transparency and improve data collection statewide.

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<i>Original Date: 05-27-2010</i>
<i>Dates Revised: 06-01-2010</i>

Start time of pilot

EMPLOYEE ACCIDENT & INJURY REPORT FORM

SECTION 1: Identifying Information of Incident	
Date	Shift <input type="checkbox"/> 1st <input type="checkbox"/> 2 nd <input type="checkbox"/> 3rd
Time	
Employee Name <i>(Last, First, M.I.):</i>	
Job Title:	<input type="checkbox"/> RN <input type="checkbox"/> LPN <input type="checkbox"/> CNA <input type="checkbox"/> Supervisor/Manager <input type="checkbox"/> Psychologist <input type="checkbox"/> Social Worker <input type="checkbox"/> Physician <input type="checkbox"/> Housekeeping <input type="checkbox"/> Maintenance <input type="checkbox"/> Other: _____
Unit of occurrence:	<input type="checkbox"/> Nanticoke <input type="checkbox"/> Choptank <input type="checkbox"/> Wicomico <input type="checkbox"/> Stepping Stone <input type="checkbox"/> Treatment Mall <input type="checkbox"/> Other: _____
Location of occurrence:	<input type="checkbox"/> Nurses station <input type="checkbox"/> Hallway <input type="checkbox"/> Patient room <input type="checkbox"/> Dayhall <input type="checkbox"/> Kitchen <input type="checkbox"/> Patient room <input type="checkbox"/> Treatment room <input type="checkbox"/> Bathroom <input type="checkbox"/> Group room <input type="checkbox"/> Other: _____
Type of Incident:	<input type="checkbox"/> Accident (fall, lift injury) <input type="checkbox"/> Assault (physical, sexual)

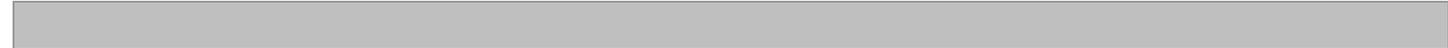
Directions: If Accident → complete Sections 2, 3 & 5

INJURY INFORMATION	
Type of Injury:	<input type="checkbox"/> No injury <input type="checkbox"/> Bite <input type="checkbox"/> Scrape <input type="checkbox"/> Choking <input type="checkbox"/> Contusion/hematoma <input type="checkbox"/> Fracture <input type="checkbox"/> Choking <input type="checkbox"/> Contusion/hematoma <input type="checkbox"/> Head Trauma <input type="checkbox"/> Laceration/cut <input type="checkbox"/> Scratch <input type="checkbox"/> Swelling/edema <input type="checkbox"/> Other _____
Characteristics	<input type="checkbox"/> Discoloration <input type="checkbox"/> Pain <input type="checkbox"/> Skin Broken <input type="checkbox"/> Bleeding <input type="checkbox"/> Lethargic <input type="checkbox"/> Redness/erythematic <input type="checkbox"/> Swelling/edema <input type="checkbox"/> Nausea/vomiting <input type="checkbox"/> Respiratory distress <input type="checkbox"/> Unresponsive <input type="checkbox"/> Other _____
Body Part Injured	<input type="checkbox"/> Head <input type="checkbox"/> Face <input type="checkbox"/> Neck <input type="checkbox"/> Bleeding <input type="checkbox"/> Shoulder left <input type="checkbox"/> Shoulder right <input type="checkbox"/> Bicep left <input type="checkbox"/> Bicep right <input type="checkbox"/> Elbow left <input type="checkbox"/> Elbow right <input type="checkbox"/> Wrist left <input type="checkbox"/> Wrist right <input type="checkbox"/> Torso <input type="checkbox"/> Hip <input type="checkbox"/> Thigh left <input type="checkbox"/> Thigh right <input type="checkbox"/> Knee left <input type="checkbox"/> Knee right <input type="checkbox"/> Ankle left <input type="checkbox"/> Ankle right <input type="checkbox"/> Hand left <input type="checkbox"/> Hand right <input type="checkbox"/> Fingers _____ <input type="checkbox"/> Toes _____
TREATMENT	<input type="checkbox"/> None <input type="checkbox"/> First aid on unit <input type="checkbox"/> Emergency Room referral <input type="checkbox"/> Death Medical Provider/OD _____ Date/Time _____

Section 3: RISK FACTORS	
<input type="checkbox"/> Environmental/safety issues <input type="checkbox"/> Wet/slippery surfaces <input type="checkbox"/> Equipment failure <input type="checkbox"/> Hazardous materials <input type="checkbox"/> Substance use or abuse <input type="checkbox"/> Other _____	

Risk Committee Notified? Yes No

During seclusion or restraint Yes___ No___ If yes,	
<i>Seclusion or Restraint:</i>	describe: _____
<i>Violence Indicators:</i>	<input type="checkbox"/> Patient with violence history <input type="checkbox"/> History of substance abuse or use <input type="checkbox"/> Involuntary patient <input type="checkbox"/> Forensic Involvement
Treatment Issues	<input type="checkbox"/> Medication change, when _____ <input type="checkbox"/> Change in privileges <input type="checkbox"/> Team issues <input type="checkbox"/> Unusual events such as bad news or family issues <input type="checkbox"/> Other _____
Warning signs	<input type="checkbox"/> Visible anger <input type="checkbox"/> Yelling <input type="checkbox"/> Verbal threats <input type="checkbox"/> Reported violent thoughts <input type="checkbox"/> Requested PRN for agitation prior to event
<i>STAFF ISSUES</i>	<input type="checkbox"/> Staff alone with patient <input type="checkbox"/> Staff not familiar with patient Estimate time until additional staff arrived if applicable _____
Notification of incident or code	<input type="checkbox"/> Panic alarm <input type="checkbox"/> Yelling <input type="checkbox"/> Another patient <input type="checkbox"/> Another staff <input type="checkbox"/> Other _____



<i>Supervisor:</i>	Name _____	Date/Time _____
Hospital Police:	Name _____	Date/Time _____
Family or Emergency Contact	Name _____	Date/Time _____
<i>PERSONNEL:</i>	Name _____	Date/Time _____
Clinical Director or CEO if indicated	Name _____	Date/Time _____

Additional Information

STOP TIME_____

Appendix B

Assessment Tool Content Validity Evaluation

Please respond to the following statements by circling the 4 - item Likert scale where:

1 = not relevant 2= somewhat relevant 3= relevant or 4= very relevant

In comment section please make improvement or additions suggestions.

Do not sign your name. Do not record any other identifiable data on this evaluation. Your willingness to complete the evaluation is most appreciated and indicates your implied consent to participate.

Please forward this questionnaire to the evaluator in an email by June 30, 2010.

Item	Likert scale response				Comments
General Information:					
Employee job title:	1	2	3	4	
Number of staff on unit:	1	2	3	4	
Unit of occurrence:	1	2	3	4	
Location of incident on unit or mall:	1	2	3	4	
Time and Date:	1	2	3	4	
Type of Incident:					
Accident/Injury category:	1	2	3	4	
Happened during seclusion or restraint:	1	2	3	4	
Injury Information:					
Type of injury:	1	2	3	4	
Characteristics of injury:	1	2	3	4	
Body part injured:	1	2	3	4	
Treatment:	1	2	3	4	

<p>Risk Factors:</p> <p>Types of risk factors:</p> <p>Risk Committee Notified:</p> <p>Violence Factors:</p> <p>Seclusion or restraint:</p> <p>Violence Indicators:</p> <p>Treatment Issues:</p> <p>Warning signs:</p> <p>Staff Issues:</p> <p>Notification of incident occurrence or code:</p>	<p>1 2 3 4</p>	
<p>Notifications:</p> <p>Supervisor:</p>	<p>1 2 3 4</p>	

Hospital Police:	1	2	3	4
Family or Emergency	1	2	3	4
Contact:	1	2	3	4
Personnel:	1	2	3	4
Clinical Director or CEO	1	2	3	4
if indicated:				

In your professional opinion, do you feel that the checklist will have an impact on 1) facilitating better data collection on staff injuries? How does it do that?

Comment :

Dear Selected Project Evaluator,

Thank you for agreeing to participate in this research project. The proposed development of a tool to document staff injuries is conceptualized as quality improvement project since the initial intent is to improve the documentation of employee assaults within the study organization and this will be initiated regardless of the study. The study will be conducted in three phases: 1) Review existing instruments related to staff injury in health care organizations; 2) Develop an instrument to document staff injuries and the context of these injuries; and 3) test the instrument usability/acceptability as well as identification of data capture.

This project should provide evidence that a better instrument for data collection regarding staff assaults and injuries can be used by staff and will provide essential data needed to develop strategies to prevent such assaults. This could lead to implementation of a statewide electronic surveillance and reporting system. The final tool will also improve reporting in the test site setting along with accuracy and consistency of data.

You are being asked to assess the relevancy of data collection elements to the types of information that are needed to adequately report injuries and to develop strategies to prevent such events. The experts will give opinions about how well the items capture the injury data itself, the context of the injury data, and other relevant details. They will also examine readability, format and estimate the time to complete the instrument.

This project takes place this summer, 2010. In order to help evaluate this collection tool, you are being asked to complete the enclosed survey with in 2 weeks of receiving the tool and return it to me in an email by July 2, 2010. I will send you one email reminder for completion. Please do not put your name or other personally identifiable information on the survey.

You are free to withdrawal from the survey evaluation project at any time with no consequence to your employment status. There are no direct benefits to you for your voluntary participation in this evaluation project. All information will remain confidential. Your participation is most appreciated. If you have further questions, please do not hesitate to contact me.

Survey Reminder

To employee injury data collection tool project evaluators:

This electronic communication is your reminder that your assessment tool evaluation are due to be emailed to the researcher on June 30, 2010. Please utilize the prepaid envelope that was provided in your initial mailing. Please do not include any identifying data on the survey tool.

I would like to take this opportunity to thank you for your time and talent as you complete this data.

Regards,

Georgia L Perdue MSN, CRNP
UMDSON DNP candidate 2010
georg665@verizon.net

Appendix C

Start time for form completion: _____

Original Date: 05-27-2010;
rev. 06-01-10,7/19/10

EMPLOYEE ACCIDENT & INJURY REPORT

Directions: *This form should be completed whenever an injury occurs even if it does not require medical treatment. The form is to be completed by the person injured and then forwarded to their supervisor for further documentation. A copy is to be sent to employee health and to infection control if indicated.*

SECTION 1: Identifying Information of Incident			
Date	Time of injury <input type="checkbox"/> 2 nd	Shift <input type="checkbox"/> 1st <input type="checkbox"/> 3rd	Time form completed
Employee Name (Last, First, M.I.):			
Job Title:	<input type="checkbox"/> RN <input type="checkbox"/> LPN <input type="checkbox"/> CNA <input type="checkbox"/> Supervisor/Manager <input type="checkbox"/> NP <input type="checkbox"/> Psychologist <input type="checkbox"/> Social Worker <input type="checkbox"/> Physician <input type="checkbox"/> <input type="checkbox"/> Housekeeping <input type="checkbox"/> Maintenance <input type="checkbox"/> Other: _____		
Unit of occurrence: <input type="checkbox"/> Nanticoke <input type="checkbox"/> Choptank <input type="checkbox"/> Wicomico <input type="checkbox"/> Stepping Stone <input type="checkbox"/> Treatment Mall <input type="checkbox"/> Other: _____			
Location of occurrence: <input type="checkbox"/> Nurses station <input type="checkbox"/> Hallway <input type="checkbox"/> Patient room <input type="checkbox"/> Dayhall <input type="checkbox"/> Kitchen <input type="checkbox"/> Patient room <input type="checkbox"/> Treatment room <input type="checkbox"/> Bathroom <input type="checkbox"/> Group room <input type="checkbox"/> Other: _____			
Type of Incident: <input type="checkbox"/> Accident (fall, lift injury, slips) <input type="checkbox"/> Assault (physical, sexual) <input type="checkbox"/> Needlestick <input type="checkbox"/> Chemical exposure			

If Accident, Needlestick, Chemical exposure → complete Sections 2, 3 & 5

If Assault → complete Sections 2, 3, 4, & 5

Section 2: INJURY INFORMATION

Type of Injury:	<input type="checkbox"/> No injury <input type="checkbox"/> Bite <input type="checkbox"/> Scrape <input type="checkbox"/> Choking <input type="checkbox"/> Contusion/hematoma <input type="checkbox"/> Fracture <input type="checkbox"/> Contusion/hematoma <input type="checkbox"/> Head Trauma <input type="checkbox"/> Laceration/cut <input type="checkbox"/> Scratch <input type="checkbox"/> Spitting <input type="checkbox"/> Swelling/edema <input type="checkbox"/> Other: _____
Characteristics	<input type="checkbox"/> Discoloration <input type="checkbox"/> Pain <input type="checkbox"/> Skin Broken <input type="checkbox"/> Bleeding <input type="checkbox"/> Lethargic <input type="checkbox"/> Redness/erythematic <input type="checkbox"/> Swelling/edema <input type="checkbox"/> Nausea/vomiting <input type="checkbox"/> Respiratory distress <input type="checkbox"/> Unresponsive <input type="checkbox"/> Other: _____
Body Part Injured	<input type="checkbox"/> Head <input type="checkbox"/> Face <input type="checkbox"/> Neck <input type="checkbox"/> Bleeding <input type="checkbox"/> Shoulder left <input type="checkbox"/> Shoulder right <input type="checkbox"/> Bicep left <input type="checkbox"/> <input type="checkbox"/> Bicep right <input type="checkbox"/> Elbow left <input type="checkbox"/> Elbow right <input type="checkbox"/> Wrist left <input type="checkbox"/> Wrist right <input type="checkbox"/> Torso <input type="checkbox"/> Hip <input type="checkbox"/> Thigh <input type="checkbox"/> left <input type="checkbox"/> Thigh right <input type="checkbox"/> Knee left <input type="checkbox"/> Knee right <input type="checkbox"/> Ankle left <input type="checkbox"/> Ankle right <input type="checkbox"/> Hand left <input type="checkbox"/> <input type="checkbox"/> Hand right <input type="checkbox"/> Fingers <input type="checkbox"/> Toes <input type="checkbox"/> Other: _____

TREATMENT	<input type="checkbox"/> None <input type="checkbox"/> First aid on unit <input type="checkbox"/> Emergency Room referral <input type="checkbox"/> Death Healthcare Provider/OD _____ Date/Time _____
------------------	--

NEEDLESTICK	Type of sharps involved _____ Activity when Needlestick occurred _____
--------------------	--

LOSS OF WORKTIME Amount of days _____ Modified Duty Yes No

Need for Modified Duty

Section 3: CONTRIBUTING FACTORS (CHECK ALL THAT APPLY)

Environmental/safety issues Wet/slippery surfaces Equipment failure Hazardous materials Substance use or abuse Work factors/practice **Other** _____

Risk Committee Notified? Yes No

During seclusion or restraint Yes___ No___ If yes, describe: _____

Section 4: VIOLENCE RISK FACTORS (CHECK ALL THAT APPLY)

Violence Indicators:	<input type="checkbox"/> Patient with violence history <input type="checkbox"/> History of substance abuse or use <input type="checkbox"/> Involuntary patient <input type="checkbox"/> Forensic Involvement <input type="checkbox"/> Other _____
Treatment Issues	<input type="checkbox"/> Medication change, when _____ <input type="checkbox"/> Change in privileges <input type="checkbox"/> Team issues <input type="checkbox"/> Unusual events (bad news, family issues, etc) <input type="checkbox"/> Other _____
Warning signs	<input type="checkbox"/> Visible anger <input type="checkbox"/> Yelling <input type="checkbox"/> Verbal threats <input type="checkbox"/> Reported violent thoughts <input type="checkbox"/> Requested PRN for agitation prior to event <input type="checkbox"/> Other _____
STAFF ISSUES	<input type="checkbox"/> Staff alone with patient <input type="checkbox"/> Staff not familiar with patient Estimate time until additional staff arrived if applicable _____ <input type="checkbox"/> Other _____
Notification of incident or code	<input type="checkbox"/> Panic alarm <input type="checkbox"/> Yelling <input type="checkbox"/> Another patient <input type="checkbox"/> Another staff <input type="checkbox"/> Other _____

Section 5: NOTIFICATIONS

Supervisor:	Name _____ Date/Time _____
Hospital Police:	Name _____ Date/Time _____
Family or Emergency Contact:	Name _____ Date/Time _____
PERSONNEL:	Name _____ Date/Time _____

Additional Information (what employee was doing at time of injury)

Person completing form: _____ Date completed: _____

Stop time for form completion: _____

Appendix D

Scenario I

You are a dietary employee and at work in the kitchen. You accidentally burned yourself on grease from the deep fryer during lunch preparation around 11:30 AM. You have splash burns on your left hand, first three fingers and top of wrist. You immediately run water over your hand and ask your co-worker to go get the supervisor. You show your burn to your supervisor who sends you to Central Services to see the Nurse Practitioner (NP). The NP examines the burn and due to the severity sends you to the emergency room for treatment. Your burns are treated in the emergency room and you are placed out of work for three days with follow-up ordered with your primary care provider.

Scenario II

You are on the Choptank unit working as a CNA on second shift and two patients begin to fight with each other in the dayhall around 6:00 PM. They are punching and kicking each other, a code green is called by your co-worker, the RN charge. Staff rush in, and along with you, attempt to separate the patients. In the process you are kicked in the right leg by the one of the patients, fall to the ground, and hurt your right ankle and foot. The patients are separated and sent to their bedrooms to cool off. Your leg and foot begins to bruise and swell and you cannot walk on it. You also have swelling and bruising of your right calf and knee. The doctor on call or OD is called and you are advised that you need to go to the emergency room for x-rays to rule out sprain vs. break. Hospital police assist you to their vehicle and you are transported to the ER. Once in the emergency room you are evaluated and sent home with a severe sprain of the right ankle and knee with bruising. You are told to avoid using the foot over the weekend and to see your own doctor on Monday.

Instructions

Test Instrument SIDCI DRAFT

This is a **voluntary project**. Completion of this form for testing is considered consent by participant.

Completion of this instrument is part of a data collection quality improvement study and **in no way** will impact volunteers job.

Each volunteer will take an envelope with two scenarios and the new injury reporting form to complete for each. The volunteer is asked to fill in all available information for each form and then complete short survey at the completion of the exercise. Please make sure you put in your start time and stop time on the forms.

At the completion of the exercise (forms and survey), the volunteers are asked to place paperwork back in envelope, seal it, and then to place envelope in mail to reviewer. ***Please do not enter any names on any of the paperwork.***

Upon completion of the review of data, reports will be available to staff, supervisors and administration about the tools and further recommendations.

Doctorate of Nursing Practice

*Development and evaluation of a
surveillance instrument for monitoring
and cataloging staff injuries in a state
mental hospital*

Georgia L. Perdue MSN, FNP-BC

Doctor of Nursing Practice Candidate

Committee Members

Kate McPhaul, PhD, MPH, RN

Meg Johantgen, PhD, RN

David Pytlewski, MD

Capstone Project Overview

The review of staff injury
documentation instruments of
public and private mental health
facilities

Develop an instrument to document
staff injuries and their context

Test the usability and acceptability
and the ability of the instrument to
reliably capture relevant data
elements

Background: Staff injuries

Healthy Work Environments

Patient safety

Staff safety

Violence prevention

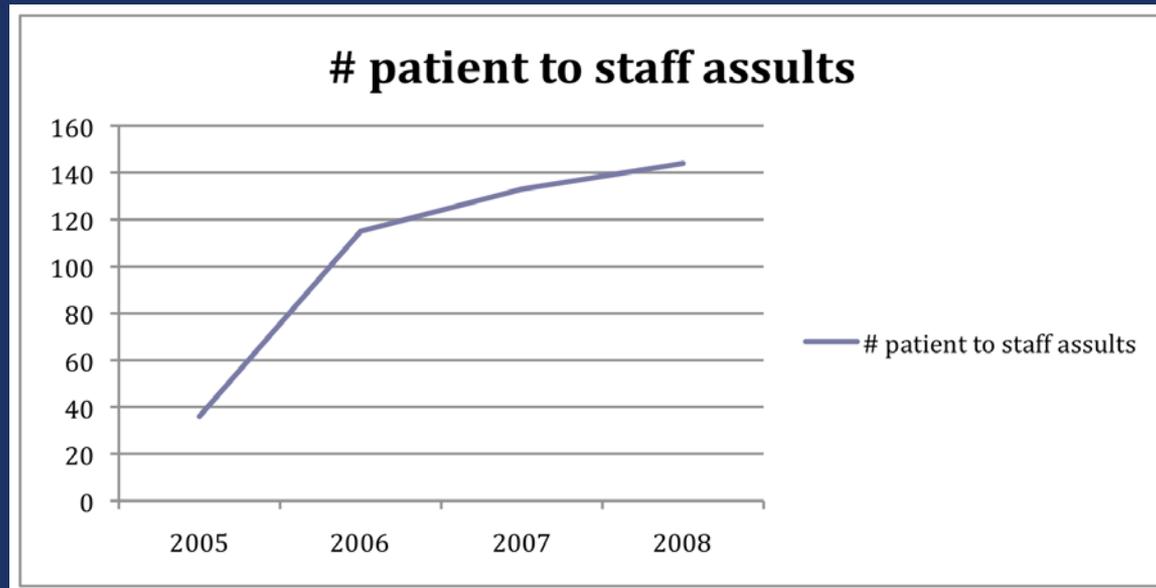


Evidence for Violence Prevention Assessment

There is evidence that fiscal year 2007 and 2008 have increasing patient to patient and patient to staff assault numbers.

306 incidents up over 30% from 2007 with 144 patient-to-patient and 162 patient-to-staff assaults

Assault data



Research Question

Does the development and testing of a Staff Injury Data Collection Instrument (SIDCI) at Eastern Shore Hospital Center improve reliability and standardization of data collection?

OSHA Violence Prevention Standards

Strong violence prevention culture or safety culture

Management commitment and employee involvement

Worksite analysis

Hazard prevention/control

Safety and health training programs

Recordkeeping and program evaluation

Comprehensive plan for security in workplace

Ongoing follow up to incidents

Literature review

High number of assaults against staff in mental health facilities with several studies over 17 years (Washington State Dept of Labor & Insustries, 1999)

Most injury surveillance systems in the literature have been designed to assist in injury prevention and to prioritize the data for prevention strategies (Arnetz & Arnetz, 2000; Lipscomb, Silverstein, Slavin, Cody & Jenkin, 2002; Worthington & Franklin, 2001)

Most studies have measure of violence but are not standardized or consistent and few tools are well validated or have known reliability.

Literature review

Standardized definitions of injuries due to assaults from patients have not been established (University of Iowa Injury Prevention Research Center, 2001)

Workers compensation reports also typically involve lost work time or medical care since compensation for the time lost and medical care is the primary purpose of the program.

Types of Workplace Violence

Type I: A criminal act is included in the violence toward an employee.

Type II: A customer or client who becomes violent while being served by the health care worker toward that worker and perpetrates violence.

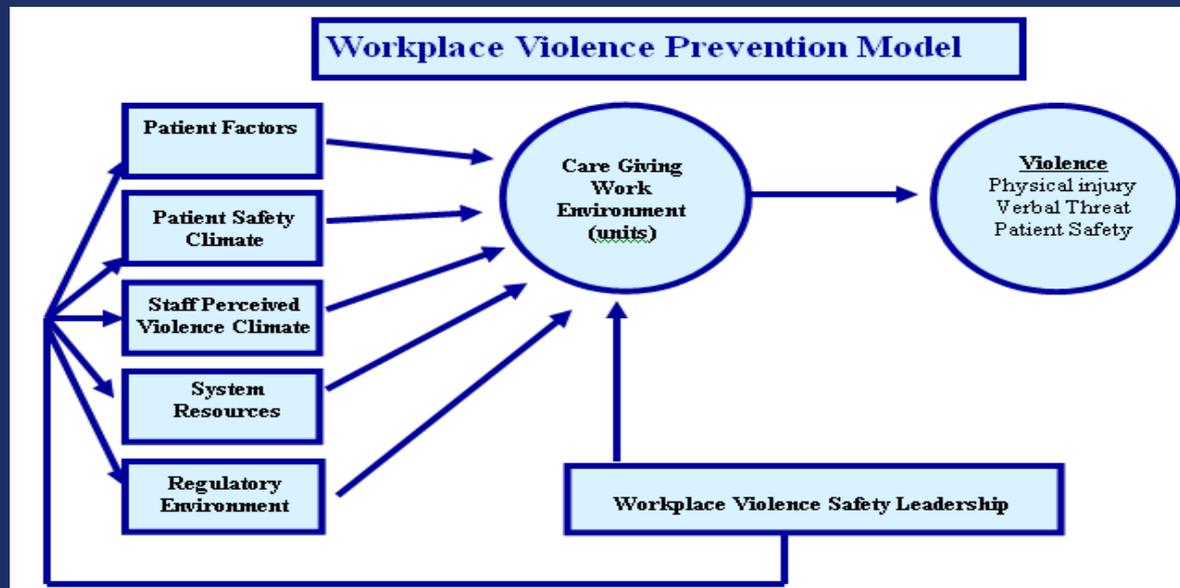
Type III: Is worker on worker violence.

Type IV: Is violence resulting from a personal relationship between the perpetrator and the employee.

(Peek-Asa, Runyan, & Zwerling, 2001)

Theory: Workplace Violence Prevention Model

McPhaul and Lipscomb



Haddon Matrix applied to Workplace Violence in a Psychiatric Hospital Setting

Figure 1. The Haddon Matrix applied to Workplace Violence in a Psychiatric Hospital Setting

<i>Phases</i>	<i>Host</i>	<i>Agent</i>	<i>Physical Environment</i>	<i>Social Environment</i>
Pre-Event (Prior to assault)	Education Training Experience Knowledge	History of prior violence, forensic involvement	Objects that could be weapons, weapon, layout of unit.	Avoid patient between staff and doorway, work in pairs, visual contact with other staff.
Event (Assault)	Alarms, mirrors, other staff, de-escalation and escape techniques.	Moving away from patient, getting assistance from other staff, Code Green.	Egress, alarms, phone calls, code called.	Security and code procedures
Post-Event (After assault)	Medical Care/De-briefing, counseling	Legal options to press charges, removal to quiet room, seclusion/restraint, medication	Evaluation of event, review of reports, evaluate physical environment	Staff debriefing, discussion, follow-up by supervisors/administration. Risk Mgmt group review. Monthly Seclusion and Restraint meeting reviews.

Study Design

The study was conducted in three phases:

1. Review existing instruments related to staff injury in health care organizations: this phase has been completed.
2. Develop an instrument to document staff injuries and the context of these injuries.
3. Test the instrument usability/acceptability as well as identification of data capture.

Setting

A state psychiatric inpatient hospital on the Eastern Shore of Maryland

- 3 inpatient units
- 1 Assisted Living unit
- 20 beds each

70% population is forensic in nature

Human Subject Issues

Approval from CEO of test site

IRB approval from The University of Maryland School of Medicine for this to be exempt as a QI study

Password protected computer for data

Removal of staff identifiers on new survey except for classification and on old reports remove all but age, gender and classification

Collection of surveys by staff and left for researcher

Volunteers to participate

Target Sample

Any clinical and support staff that have potential to be injured by patient

198	Nursing personnel (consisting of Nursing Supervisors, Nurse Managers, Charge Nurses, RN's, LPN's, and CNA's)
7	Maintenance
5	Social Workers
5	Housekeepers
9	Physicians
1	Nurse Practitioner
9	Activity Therapists
5	Psychologists
16	Support staff
255	TOTAL STAFF

Sample

An adequate sample size is 20-30% of personnel but due to budget and time constraints along with the fact the sample was made up of volunteers, the researcher hoped to obtain 10% or 19-20 staff. This was a convenience sampling of staff at the time of implementation of the tool.

Phase 1: Review of Existing Tools

Origin	Purpose	Length	elements
Ohio	Workers Compensation Reporting	3 pages	28
New York	Children's Camp Program	3 pages	48
Georgia	Central State Hospital Accident and Injury Report	2 pages	50
Univ of Alabama	Employee, Student, and Visitor Incident Reporting Form	1 page	22
Eastern Shore Hosp Ctr	Employee's Report of Accident	1 page	16
Finan Center	Employee's Report of Injury	1 page	23
State of PA	Management of Incidents and Incident Reporting and Risk Management Policy and Procedures	4 pages	88

Phase 2: Instrument Development

Based on literature review there were no available standardized, valid or reliable injury data collection tools available

Items were developed using available information from the existing injury tools reviewed, and the requirements for reporting injuries to Workers Compensation

The new tool was tied into the Haddon Matrix under Environment-Post event, where evaluation of the event and review of reports take place

McPhaul and Lipscomb model under system resources, workplace violence safety leadership, and regulatory environment

The Experts Review

- * Given to 6 experts in the field of occupational health or researchers with work in workplace injuries area
- * Four were female and two male
- * All completed questionnaires and agreed items ranked as relevant or very relevant
- * 4 of 6 ranked all items very relevant

Phase 3: Testing the new instrument

Case studies developed that represented common situations where a form should be completed.

Tool to measure usability and acceptability were developed from existing instruments

The investigator passed out the study packets with directions that asked the volunteer to:

- 1) use the case study to complete the new form and
- 2) complete the usability/acceptability survey.

Open-ended questions

In addition to completing Likert items, open-ended questions were used to solicit more details from staff:

1. What do you think the best thing about the new instrument?
2. What suggestions would you have for improvement?
3. Any other comments are welcome! Do you have further suggestions for improvement of the tool?

Convenience Sample (N=32)

Hospital Police	2
Social Worker Supervisor	1
Activity Therapist	2
Housekeeper	2
Staff Development Secretary	1
Pharmacist	1
Phlebotomist	1
RN Supervisor	1
RN Manager	1
RN Charge	1
RN	5
LPN	3
CNA	1

10 respondents did not list their classification

Questionnaire Results

Table III. Staff instrument survey questions

	N	Mean (SD)
Perceived Usefulness		
1 Using the instrument would enable me to complete report more quickly	32	3.69 (1.18)
2 Using the instrument would improve documentation of important data	32	3.81 (1.06)
3 Using the instrument would increase the ability to prevent injuries	32	2.78 (1.10)
4 Using the instrument would help me communicate information about injuries to administration and management	32	3.88 (1.01)
5 Using the instrument will increase awareness of staff safety	32	3.41 (1.07)
Sum		3.52 (0.95)
Perceived Ease of Use		
1 Using the new instrument was easy for me	32	3.78 (1.13)
2 The instructions were clear and easy to implement	32	3.84 (1.02)
3 The instrument itself was clear	32	3.88 (1.07)
4 The definitions were specific to my workplace	32	3.81 (0.97)
5 Using the new instrument does not take more time than using the old form	32	3.50 (1.16)
Sum		3.78 (0.97)

Note. Likert item score: 1= strongly disagree, 2=disagree, 3 = neither agree or disagree, 4= agree, 5=strongly agree

Responses to Open-ended questions

"It was easy to use and clear"

"This still does not address safety ", "staff need to work together more", "we need more staff"

"The tool is "idiot proof", nice..."

"chose a large font size", "use of bolder print" and "separate the reporting sections for supervisor and personnel regarding the injury time lost and notifications"

Conclusions

Tool was useful and easy to use

Staff felt that there needed to be further measures to improve safety on the units

An unexpected finding: Staff indicated that using the instrument would not improve workplace safety

Further pilot testing of the instrument with live data is needed to make sure all needed elements have been included

Dissemination

Report to hospital administration and Health & Safety Committee

Presentation to staff in staff meetings and Grand Rounds to teach use of updated tool

Poster presentations at regional and national conferences in 2011

Publications in peer reviewed journals

Translation of Findings

Get buy-in from administration

Test with live data

Revise instrument as needed

Get support from other stakeholders to use in other facilities

Further research in other state psychiatric hospitals

Develop a statewide database to track employee injuries

Additional Presentations related to Project

- * Presentation to MNA District 2 on Workplace Violence-Spring 2010
- * Presentation to ESHC facility Health and Safety Committee on findings- September 2010
- * Presentation at MNA Annual Conference on impact of workplace violence and its relationship to Healthcare Reform-October 2010
- * Evaluation and update of Violence Policy and Plan at Eastern Shore Hospital Center November-December 2010

Development and evaluation of a surveillance instrument for monitoring and cataloging
staff injuries in a state mental hospital as prepared for presentation to the Health and
Safety Committee of Eastern Shore Hospital Center

Georgia L Perdue

Doctor of Nursing Practice Candidate

University of Maryland

School of Nursing

October 2010

Issue

Over 48% of all non-fatal injuries from workplace violence occurred from occupational assaults on health care workers (Bureau of Labor Statistics, 2008). Multiple authors have during the past ten years reviewed the increasing risk of workplace violence and its impact on both the health care provider and patient (Arnetz & Arnetz, 2000; Lipscomb, Silverstein, Slavin, Cody & Jenkin, 2002; Worthington & Franklin, 2001). In 2003 to 2004 at the proposed study site, changes in political climate and philosophy occurred as a result of media exposure to deaths in juvenile institutions during seclusion and restraint applications. This initially affected federal regulations regarding seclusion and restraint and required reduction of the use of this type of intervention. The State of Maryland chose to focus on reduction of seclusion and restraint use in all of the psychiatric hospitals in 2005. Data from the Quality Improvement database at the hospital indicated an increase in-patient to staff assaults from fiscal year 2005 and thirty-six assaults to fiscal year 2006 and one hundred fifteen assaults. As indicated in Table 1, the one-year increase in assaults by patient on staff and other patients in our facility has continued to be an ongoing issue (Eastern Shore Hospital Center, 2008). This data was documented using an antiquated and time intensive process involving multiple staff reviewing narrative reports. What is urgently needed is both a standardized way to track each incident and an electronic surveillance and reporting system that can track assaults and descriptive information about each incident.

Table I. Assault Data Overview

<i>Fiscal Year</i>	<i>Number of Patient to Staff Assaults</i>
2005	36
2006	115
2007	133
2008	144

In addition to the lack of adequate surveillance and documentation systems, the costs of these injuries are substantial. Costs of assaults incurred in the test site, a Maryland state psychiatric hospital, in fiscal year 2008, include medical care for injuries suffered by patients such as a recent severed tendon and muscle requiring over \$500,000 in repair, therapy and follow-ups. Additional costs are the overtime and staffing shortages necessitated by violence and injury to staff members that prevent them from working, increased costs of one to one behavior management and cost of sending staff with patients to address injuries in emergency rooms, hospitals, to outpatient therapy, or follow-up appointments. The actual dollar amounts for these costs are not currently captured but the increased numbers of overtime hours in fiscal year 2008 were and compared to fiscal year 2007 it totaled an increase of over 30% in the nursing department alone. These costs support the significance of a need to track and reduce injuries to staff and patients.

Another recent change is the population shift in psychiatric hospitals to include patients with developmental disabilities in addition to mental illness. Implications for nursing are increased injuries to staff, short staffing, trauma to both patients and staff, and increasingly dangerous work environments. Outcomes for this project are to provide better data that track incidents, identify potential influences, and inform interventions designed to decrease violence. The factors in the instrument will provide details necessary to make changes and improve the whole system.

Background

In fiscal year 2007 data from the Quality Improvement (QI) department of a state psychiatric hospital in the Maryland Mid-Atlantic region of the United States indicated that there were 277 incidents of assault (Eastern Shore Hospital Center, 2007). Among these, 144 of the assaults were patient-to-patient incidences, and 133 were patient-to-staff assaults. In fiscal year 2008, the number of incidents increased to 306 with 162 patient-to-patient assaults and 144 patient-to-staff assaults.

Challenges and Unknown Issues

This dramatic one-year increase in assaults together with ample evidence from the literature documenting the extent of the problem nationally, suggested that this hospital had an escalating problem with staff assaults. Unfortunately, the data system relied on manual counting of incident reports, which do not collect the information in a standardized fashion. Consistent definitions together with reliable tracking was needed to improve the facility's tracking of common risk factors for staff assault or injury and assist in the development of preventive measures. Lack of consistent definitions for types of injuries, violence, location of injury on body, and descriptions of context has resulted

nearly unusable data. In the investigator's experience, direct care staff avoided completion of incident reports or provide incomplete documentation due to time constraints, confusion over legal ramifications of reporting, and inconsistent definitions.

Current Workers Compensation policy guidelines indicate that reportable injuries are those that result in: death, loss of consciousness, days of lost work time, restricted work activities, medical treatment beyond first aid and injuries requiring emergency room treatment (Ruser, 2008). Furthermore, injuries from assaults were documented using an antiquated and time intensive process involving multiple staff reviewing narrative reports.

Problem

A consistent, valid and reliable instrument for data collection, which could be later adapted to an electronic surveillance and reporting system, was urgently needed to track assault data and descriptive information in a timely manner. The Problem, Implementation, Comparison, and Outcomes (PICO) question was: *Does the development and testing of a Staff Injury Data Collection Instrument (SIDCI) at Eastern Shore Hospital Center improve reliability and standardization of data collection?* This question was chosen after the discovery of an inability to track data on staff injuries because the survey instrument was narrative and without clear definitions.

The purpose of this project was to develop and test a tracking instrument that obtained detailed information regarding staff assaults and injuries in a Maryland psychiatric hospital. The ultimate objective is to implement the data collection instrument in a statewide system. Such statewide data collection could then be used to develop clearer strategies to prevent assaults and injuries.

The Study

This project developed and tested a tracking instrument that obtained detailed information regarding staff assaults and workplace injuries in a Maryland psychiatric hospital. Steps of the project included: 1) review of other surveillance instruments, 2) development of a new tracking instrument, and, 3) testing the instrument with direct care personnel using simulated cases to assess usability/acceptability and ability to adequately capture relevant data elements.

Methods

This project was a descriptive design utilizing two survey questionnaires. The study was conducted in three phases: 1) Review existing instruments related to staff injury in health care organizations; 2) Development of an instrument to document staff injuries and the context of these injuries; and 3) testing the instrument usability/acceptability as well as identification of data capture. This was done using expert opinion and a pilot study with a convenience sample of 32 volunteer staff testing the devised instrument then completing a survey of its usefulness and usability. The models chosen for this project included a foundation model (The Haddon Matrix) and one that is new and includes theoretical perspectives of the Haddon Matrix (Christoffel & Gallagher, 2006), work stress models, and the National Institute of Safety and Health Work Organization Framework and Perceived Violence Climate (NIOSH 2008) as adapted from the safety climate by Lipscomb and McPhaul (McPhaul & Lipscomb, 2004).

Findings

Phase 1: Review Existing Instruments

Much of the review of existing instruments had already been completed prior to approval of this project as part of an internal quality improvement process in the study organization. To better explicate the limitations of the current data collection instrument and procedures, a systematic review of procedures was conducted. The researcher, in conjunction with the Health and Safety Committee of Eastern Shore Hospital Center completed a review of the injury data available. This group consists of the Safety officer, Chief Operations Officer, representative of Quality Improvement department, Infection Control Nurse, and a representative of Nursing Administration. The researcher was added to this committee at her request and with the approval of the Chief Executive Officer. The injury data was examined and issues with definitions and procedures identified.

Table II. Summary of data collection instruments reviewed

<i>Origin</i>	<i>Purpose</i>	<i>Length</i>	<i>Number of Elements</i>
Ohio	Workers Compensation Reporting www.ohiodnr.com/Portals/0/hr/forms/ADM4303.pdf	Three pages	28
New York	Workers Compensation Reporting www.wcb.state.ny.us	Six pages	51
New York Bureau of Community Environment Health and Food Protection	Children's Camp Program co.suffolk.ny.us/.../healthservices/php_InjuryReportForm.pdf	Three pages	48
Georgia Department of Human Resources	Central State Hospital Accident and Injury Report http://www.centralstatehospital.org/forms/071101%20A%20and%20I.doc	Two pages	50
University of Alabama at Birmingham	Employee, Student, and Visitor Incident Reporting Form www.healthsafe.uab.edu	One page	22
Eastern Shore Hospital Center Maryland	Employee's Report of Accident	One page	16
Thomas B Finan Center Maryland	Employee's Report of Injury	One page for employee	23
State of Pennsylvania	Management of Incidents and Incident Reporting and Risk Management Policy and Procedures	Four pages	88

The instruments reviewed on average had one to three pages with the Pennsylvania containing the longest number at four. All forms but two (Georgia and Pennsylvania) had paragraph descriptions of the incident without detail check boxes or lines. All forms included causation, time of day, person identification data, and time lost. All but the *Camp Program* had data that was collected for Workers Compensation Programs and included time lost. None of the forms appeared to include data collection for minor injuries and they all actually listed that the use was for injuries requiring “more than simple first aid”. The number of elements varied widely and the more detailed injury statistics were found on the Pennsylvania forms such as wound descriptions, body parts affected and larger number of choices regarding which body part was affected.

Ultimately based on the review, the essential components included in the newly developed instrument were identified, clearly defined, and drafted. Examples of some of the components included causation, time of day, unit of occurrence, if patient involved, type of injury, location of injury on body, severity of injury (to include requirement of emergency treatment or somatic hospitalization) and type of assault. Attempts were made to include all injuries even if they were not assault related or did not result in significant treatment other than simple first aid. The instrument was intended to capture data for quality improvement purposes and also the necessary data to record the injuries on an Occupational Safety and Health Administration (OSHA) 300 form. OSHA requires recording work-related injuries that result in death, loss of consciousness, days away from work, restricted work activity or transfer, and medical treatment beyond first-aid. Data recorded on OSHA 300 form includes: date of occurrence; injury description and part of body affected; classification such as death, days away from work; and finally, type

of injury or illness sustained (United States Department of Labor Occupational Safety and Health Administration, 2001).

Building on the internal evaluation of the current forms and procedures, the researcher obtained six to ten injury-reporting forms in total from hospitals and facilities in various states.

Phase 2: Developing revised instrument

In collaboration with the Health and Safety Committee of Eastern Shore Hospital Center and the Capstone Committee, a new form was developed to collect injury data (Appendix I). As described above, the first stage of developing the *Staff Injury Data Collection Instrument or SIDCI* was to review the literature for any existing tools and to obtain results of the data review from the Health and Safety Committee. The Committee was then tasked with advising the researcher on essential components of the instrument needed to measure injury statistics. Next, items of the questionnaire were developed using the available information from existing injury tools, the data obtained from record review, and the collaboration with the Capstone Chairperson.

A crucial part of instrument development is the establishment of validity. The construct validity of an instrument is measured on its ability to measure what it designed to measure (Santamaria, Daly, Addicott, & Clayton, 2000; Muller-Staub, Lunney, Odenbreit, Needham, Lavin & Achterberg, 2008). Construct validity can be improved by content validity. Content validity measures the variable of interest and can also be used to measure the appropriate sampling of the content domain of items in a questionnaire. It addresses the match between instrument questions and the content or subject area they are intended to assess. Not only should content validity begin with instrument

development but it is also used to define the construct of interest. Defining these traits provides a clearer picture of limitations, dimensions, and components of the subject (Yaghmaie, 2003). Content validity should be determined by expert opinion. This type of validity has existed as part of instrument development since the 1950's (Hatcher & Colton, 2007). With regard to this tool the construct of interest is the impact of new staff injury instrument on standardization of data collection. Domains include type of injury, characteristics of injury, severity, treatment, body location, unit of occurrence, location within the unit, time of day, date, cause of incident, environmental and safety issues, and physical conditions. Content validity was to be determined by experts and therefore the next step was choosing four to six experts in the field of occupational health and workplace safety.

Expert evaluation

The experts were asked to assess the relevancy of data collection elements to the types of information that are needed to adequately report injuries and to develop strategies to prevent such events. The experts then gave opinions about how well the items captured the injury data itself, the context of the injury data, and other relevant details. They also examined readability, format and estimate the time to complete the instrument. A four point scale based on the Content Validity Index developed by Waltz and Bausell was used that included 1 not relevant, 2 item needs some revision, 3 relevant but needs minor revision, and 4 very relevant (Waltz & Bausell, 1983). The instrument and questionnaires were given to six experts in the field of occupational health or researchers with work in workplace injuries. Four of the experts were female and two male. All six completed their questionnaires (Appendix II) within a four week period and

returned them to the by email. The questionnaires were reviewed and all experts agreed that the items should rank as 3 relevant with minor revisions or 4 very relevant. Four out of six experts ranked all items as very relevant. Feedback on the instrument included suggestions for type size, additions of needlestick injuries, additions of other to several areas of the tool, adding spitting to type of injury, and correction of typographical errors and phrasing for clarity. Based on feedback from the experts, as well as collaboration with internal experts and Capstone committee, the instrument was then revised as indicated (see Appendix III for final form).

Phase 3: Testing usability/acceptability and capture of relevant data

Experts provided important review of data elements and the form itself in relation to the data that is important to capture for reporting and quality improvement. Using standardized case-based scenarios the next step was to ask the staff to complete the form and answer questions about their experience to evaluate the usability and acceptability of the instrument. The scenarios represented the domains: type of injury, cause of injury, characteristics of injury, severity, treatment, body location, unit of occurrence, location within the unit, time of day, date, cause of incident, environmental and safety issues, and physical conditions and were revised by review of the Quality Improvement office. Other causes of injuries included slips, falls, and movement of patients, equipment failures, needle sticks and environmental causes. Data related to assault injuries included diagnosis of patient, previous history of violence, if occurred during seclusion or restraint, and number of available staff on units.

Sample

The study population consisted of the staff of the facility as represented by incident reports documenting reported injuries. There are 198 nursing personnel (Clinical Nurse Specialist, Nursing Supervisors, Nurse Managers, Charge Nurses, RN, LPN, and CNA), seven maintenance, five social workers, five housekeepers, seven physicians, one nurse practitioner, seven activity therapists, five psychologists, and twenty other support staff for a total of 255 staff. The most likely people to use the instrument on a daily basis are the line staff RN's, LPN's, and CNA's. A feasible sample size is 20-30% of personnel but due to budget and time constraints along with the fact volunteers were used, the researcher hoped to obtain 10% or 19-20 volunteer staff to participate. This was a convenience sampling of staff at the time of implementation of the tool. Attempts were also made to obtain other types of staff for testing and all staff was asked to volunteer. Volunteer staff members used the Health and Safety Committee developed scenarios to fill out the new data collection instruments.

Thirty-two staff members volunteered to complete this project and test the data collection instrument. All of them or 100% that accepted the forms returned them. Of the thirty-two volunteers, twenty-two identified themselves by work classification and ten did not write their job title in thus providing a 69% job identification total. The volunteer staff returning the forms were broken down into the following table:

Table III. Staff Characteristics

Hospital Police	2
Social Worker	
Supervisor	1
Activity Therapist	2
Housekeeper	2
Staff Development	1
Secretary	
Pharmacist	1
Phlebotomist	1
RN Supervisor	1
RN Manager	1
RN Charge	1
RN	5
LPN	3
CNA	1

All of the volunteer staff members filled out the tool using the scenarios provided and as the tools were reviewed it was apparent that the nursing personnel had the largest completion of data items on the tool followed by the hospital police. These staff members are frequently involved in altercations with patients and have the higher rate of injury

exposure evidenced by review of the previous data collection tools over a three-year period.

Testing scenarios

The injury scenarios were devised by the Health and Safety Committee to be utilized with the instrument by staff in order to evaluate its reliability and clarity such as a description of the type of injury occurring (see Appendix IV).

Statistical Approach and Findings

The principle research question was: *Does the development and testing of a Staff Injury Data Collection Instrument (SIDCI) at Eastern Shore Hospital Center improve reliability and standardization of data collection?* The answer to that question was to be determined by both the expert review of the data collection instrument and the staff's perceptions regarding ease of use and usefulness of the tool itself. Descriptive statistics and frequencies were the primary analyses used. Acquisition of consistent data was measured based on the employee's responses to the scenarios and the amount of data captured. The primary focus of this instrument development was the assessment of usability/acceptability by the staff testing the instrument. The means of the Likert scale items were reported in scale format indicating means for each question and standard deviations.

Table IV. Staff instrument survey questions

		N	Mean (SD)
Perceived Usefulness			
1	Using the instrument would enable me to complete report more quickly	32	3.69 (1.18)
2	Using the instrument would improve documentation of important data	32	3.81 (1.06)
3	Using the instrument would increase the ability to prevent injuries	32	2.78 (1.10)
4	Using the instrument would help me communicate information about injuries to administration and management	32	3.88 (1.01)
5	Using the instrument will increase awareness of staff safety	32	3.41 (1.07)
Sum			3.52 (0.95)
Perceived Ease of Use			
1	Using the new instrument was easy for me	32	3.78 (1.13)
2	The instructions were clear and easy to implement	32	3.84 (1.02)
3	The instrument itself was clear	32	3.88 (1.07)
4	The definitions were specific to my workplace	32	3.81 (0.97)
5	Using the new instrument does not take more time than using the old form	32	3.50 (1.16)
Sum			3.78 (0.97)

Note. Likert item score: 1= strongly disagree, 2=disagree, 3 = neither agree or disagree, 4= agree, 5=strongly agree

The outcomes indicated that the highest means were for both using the instrument to communicate with administration and management, and clarity of the instrument (3.88/1.01 and 3.88/1.07). Overall the mean for ease of use was higher than that of perceived usefulness (3.78/0.97 vs. 3.52/0.95). The lowest ranking question results was that of using the instrument would increase the ability to prevent injuries) 2.78/1.10). The

rest of the questions had means greater than 3 indicating that in general, the staff felt that the tool was useful and easy to use.

For each of the open-ended questions, responses trends were observed and items were placed into similar groupings. The researcher reviewed the results of the open-ended questions and independently identified themes. Three open-ended questions were asked of the staff that reviewed the data collection instrument: 1) what do you think the best thing about the new instrument 2) what suggestions would you have for improvement and 3) any other comments are welcome, do you have further suggestions for improvement of the tool. Common themes related to the question of the best thing about the new instrument included the quickness of filling out the new tool, simplicity of the tool, and the fact that it offered more detail and choices for injury and other information. One comment stated, “this is easy and idiot proof”. Suggestions for improvements were to “chose a large font size”, “use of bolder print” and separate the reporting sections for supervisor and personnel regarding the injury time lost and notifications. Suggestions unrelated to the instrument included comments made during the education phase of implementation regarding safety on the unit or lack of, a need for staff to work together more, and the need for additional unit staff to improve safety.

Conclusions

The examination of current available injury data collection tools, testing of a new instrument, and the pilot testing of the new tool’s usefulness and usability resulted in a clear picture of a need for improved data collection and the importance of consistency and user friendliness for staff. Ongoing improvements in reporting formats and the addition of the new Workers Compensation data requirements will

be needed prior to implementation of a final product. Expansion of the study to using statewide and specific hospital incident data for the last two to three years is possible. However, each hospital collects its own data and there are limits to access along with problems of definitions of what assault is. None of the other psychiatric hospitals in Maryland currently utilize the electronic medical record and subsequent reporting system of ESHC. A lack of clear definitions of severity of injury or what is determined to be an assault currently exists statewide. Verbal assaults are not tracked in the system and were also not tracked in the new system. There is no current electronic database or means of recording data from instrument. Not all incidents of injury are reported. Not all the staff identified themselves while participating in this project and the researcher chose not to do a formal validity index at this time due to system or facility plans to combine the final instrument from this project with new requirements in reporting from Workers Compensation and then repeat a testing with real-time data for at least one month. T

The practice question listed above and the evidence review have led us to several options for further study. Data transparency is necessary to examine the relationship of workplace injuries to the environment, education, and other factors in the facilities. The lack of a consistent way of capturing the injury data provides a large number of opportunities for further study. A possible long-term option is to develop an electronic database system to increase transparency and improve data collection statewide.

Recommendations to ESHC October 2010

- ✚ Revise current injury reporting system and include study instrument replacing existing tool
- ✚ Educate staff on study findings (can be done by researcher in staff or unit meetings)
- ✚ Add new Workers Compensation reporting requirements
- ✚ Approval by Health and Safety Committee then forward to Administrative Staff by researcher
- ✚ Test final tool with live data for 3 months as pilot, revise, then implement
- ✚ Devise a database to collect injury data to improve prevention and workplace safety
- ✚ Create a facility wide culture of safety and respect with policy, training, and staff empowerment
- ✚ Review and update workplace violence/safety policies to promote safety and worker input
- ✚ Provide final tested instrument to Statewide Health and Safety or Risk Committees for possible use in other facilities (researcher can assist with this)

EMPLOYEE ACCIDENT & INJURY REPORT

Directions: *This form should be completed whenever an injury occurs even if it does not require medical treatment. The form is to be completed by the person injured and then forwarded to their supervisor for further documentation. A copy is to be sent to employee health and to*

SECTION 1: Identifying Information of Incident

Date	Time of injury Shift <input type="checkbox"/> 1st <input type="checkbox"/> 2 nd <input type="checkbox"/> 3rd	Time form completed
Employee Name (Last, First, M.I.):		
Job <input type="checkbox"/> RN <input type="checkbox"/> LPN <input type="checkbox"/> CNA <input type="checkbox"/> Supervisor/Manager <input type="checkbox"/> NP <input type="checkbox"/> Psychologist <input type="checkbox"/> Social Worker <input type="checkbox"/> Physician <input type="checkbox"/> Nurse Practitioner <input type="checkbox"/> Housekeeping <input type="checkbox"/> Maintenance <input type="checkbox"/> Hospital Police		
Title <input type="checkbox"/> Other: _____		
Unit of occurrence: <input type="checkbox"/> Nanticoke <input type="checkbox"/> Choptank <input type="checkbox"/> Wicomico <input type="checkbox"/> Stepping Stone <input type="checkbox"/> Treatment Mall <input type="checkbox"/> Other: _____		
Location of occurrence: <input type="checkbox"/> Nurses station <input type="checkbox"/> Hallway <input type="checkbox"/> Patient room <input type="checkbox"/> Dayhall <input type="checkbox"/> Kitchen <input type="checkbox"/> Patient room <input type="checkbox"/> Treatment room <input type="checkbox"/> Bathroom <input type="checkbox"/> Group room <input type="checkbox"/> Other: _____		
Type of Incident: <input type="checkbox"/> Accident (fall, burn, lift injury, slips) <input type="checkbox"/> Assault (physical, sexual) <input type="checkbox"/> Needlestick <input type="checkbox"/> Chemical exposure		

If Accident, Needlestick, Chemical exposure → complete Sections 2, 3 & 5

If Assault → complete Sections 2, 3, 4, & 5

SECTION 2: Injury Information

Type of Injury:	<input type="checkbox"/> No injury <input type="checkbox"/> Bite <input type="checkbox"/> Scrape <input type="checkbox"/> Choking <input type="checkbox"/> Contusion/hematoma <input type="checkbox"/> Fracture <input type="checkbox"/> Contusion/hematoma <input type="checkbox"/> Head Trauma <input type="checkbox"/> Laceration/cut <input type="checkbox"/> Scratch <input type="checkbox"/> Spitting <input type="checkbox"/> Swelling/edema <input type="checkbox"/> Other _____
Characteristics	<input type="checkbox"/> Discoloration <input type="checkbox"/> Pain <input type="checkbox"/> Skin Broken <input type="checkbox"/> Bleeding <input type="checkbox"/> Lethargic <input type="checkbox"/> Redness/erythematic <input type="checkbox"/> Swelling/edema <input type="checkbox"/> Nausea/vomiting <input type="checkbox"/> Respiratory distress <input type="checkbox"/> Unresponsive <input type="checkbox"/> Other _____
Body Part Injured	<input type="checkbox"/> Head <input type="checkbox"/> Face <input type="checkbox"/> Neck <input type="checkbox"/> Bleeding <input type="checkbox"/> Shoulder left <input type="checkbox"/> Shoulder right <input type="checkbox"/> Bicep left <input type="checkbox"/> Bicep right <input type="checkbox"/> Elbow left <input type="checkbox"/> Elbow right <input type="checkbox"/> Wrist left <input type="checkbox"/> Wrist right <input type="checkbox"/> Torso <input type="checkbox"/> Hip <input type="checkbox"/> Thigh left <input type="checkbox"/> Thigh right <input type="checkbox"/> Knee left <input type="checkbox"/> Knee right <input type="checkbox"/> Ankle left <input type="checkbox"/> Ankle right <input type="checkbox"/> Hand left <input type="checkbox"/> Hand right <input type="checkbox"/> Fingers <input type="checkbox"/> Toes <input type="checkbox"/> Other _____
Treatment	<input type="checkbox"/> None <input type="checkbox"/> First aid on unit <input type="checkbox"/> Emergency Room referral <input type="checkbox"/> Death Care given by provider _____ _____ Healthcare Provider/OD _____ Date/Time _____

SECTION 3: Contributing Factors (check all that apply)

Environmental/safety issues Wet/slippery surfaces Equipment failure Hazardous materials
Substance use or abuse Work factors/practice Other _____

Risk Committee Notified? Yes No

During seclusion or restraint Yes___ No___ If yes,
describe: _____

Needlestick Injury Type of Sharps _____
Activity when injury occurred _____

SECTION 4: Violence Risk Factors (check all that apply)

Violence Indicators:	<input type="checkbox"/> Patient with violence history <input type="checkbox"/> History of substance abuse or use <input type="checkbox"/> Involuntary patient <input type="checkbox"/> Forensic Involvement <input type="checkbox"/> Other _____
Treatment Issues	<input type="checkbox"/> Medication change, when _____ <input type="checkbox"/> Change in privileges <input type="checkbox"/> Team issues <input type="checkbox"/> Unusual events (bad news, family issues, etc) <input type="checkbox"/> Other _____
Warning signs	<input type="checkbox"/> Visible anger <input type="checkbox"/> Yelling <input type="checkbox"/> Verbal threats <input type="checkbox"/> Reported violent thoughts <input type="checkbox"/> Requested PRN for agitation prior to event <input type="checkbox"/> Other _____
Staff Issues	<input type="checkbox"/> Staff alone with patient <input type="checkbox"/> Staff not familiar with patient Estimate time until additional staff arrived if applicable _____ <input type="checkbox"/> Other _____
Notification of incident or code	<input type="checkbox"/> Panic alarm <input type="checkbox"/> Yelling <input type="checkbox"/> Another patient <input type="checkbox"/> Another staff <input type="checkbox"/> Other _____

SECTION 5: Notifications

Supervisor:	Name _____ Date/Time _____
Hospital Police:	Name _____ Date/Time _____
Family or Emergency Contact:	Name _____ Date/Time _____
Personnel:	Name _____ Date/Time _____
Clinical Director or CEO if indicated:	Name _____ Date/Time _____
Loss of Worktime completed by Personnel: Need for Modified Duty	Amount of days _____ Modified Duty <input type="checkbox"/> Yes <input type="checkbox"/> No

Additional Information (what employee was doing at time of injury)

Person completing form: _____ Date completed: _____