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Abstract

Purpose: To analyze if the use of electronic medical record systems improve the timeliness and completeness of the patient physical health assessment at an assisted living facility.

Design: Quality Improvement (QI) Design. Application of an EHR was analyzed using participant data on handwritten and electronic patient physical health assessment charting.

Key Words: Electronic health record, urban assisted living facility, compliance, evidence-based practice, time duration, chart completion.

Methods: The data was collected in a 2 month period in 2018 from data recorded in paper and electronic health records. The documentation data gathered was analyzed using the International Business Machines Corporation (IBM) Statistical Package for Social Sciences (SPSS) version 20.0 software to determine the time duration, chart completion, and pre-implementation and post implementation questionnaire results of the handwritten and electronic health record.

Findings: Results indicate an 14.5% documentation time duration decrease after implementation of the EHR, and an increase in completeness from 25% to 90% after implementation of the EHR, however participant views on the software stayed consistent in support of implementation of the EHR. These findings indicate that the implementation of an EHR system improved charting time and completeness. Multiple factors could indicate the cause of the increase in percentages after implementation such as sample size, skill level of user, adaptation to new method of notification, and short time frame from implementation.

Conclusions: These findings suggest that the project could be duplicated to determine if a larger study with a longer time frame would make a difference in the outcome. Currently the findings indicate that in one small urban assisted living facility, implementation of an EHR system did improve patient physical health assessment timeliness and completeness.

Assessment Documentation: Implementation of Electronic Health Record System in an Assisted Living Facility

Historically, assisted living facilities were a senior living option with a passive monitoring system for patients with minimal needs for assistance with daily living and care. Assisted living facilities, facing rising levels of patients who require more complex care, comorbidity management and restructuring of reimbursement requirements present a push towards a medical model (Rosenbaum, 2011). Assisted living facilities were traditionally residential, and did not need to document specifically what care was provided. Now that there is a shift in this platform to a medical model with nursing staff, there is a need to capture accurate and complete health records. With this evolution to a medical model, electronic health record (EHR) documentation is necessary. The presence of the EHR in assisted living facilities will help to meet the current needs of this population and enable enhanced timely and accurate chart documentation of care coordination (Kruse et al. 2017). EHRs reduce the time spent charting, provide better safeguards against data entry error, allow for improved access to charts to implement change (Manca, 2015). Standardized documentation by nurses in EHRs uses a common language to describe assessments and implement interventions, making connections in the nursing process more explicit (Makoul, Curry, and Tang, 2001). These data are essential to demonstrate measurable program outcomes and used to quantify and evaluate patient outcomes (Makoul, Curry, and Tang, 2001). All other healthcare settings have or are shifting to EHRs and assisted living facilities need to do so as well.

This DNP project will address such problems, and implement an EMR in an assisted living setting to improve accuracy and availability of health assessment charts and improve patient outcomes.

Background

Assisted living facilities are a key component of states' long-term services and supports (LTSS) systems. Today assisted living is a fast-growing long-term care option for seniors in the United States. In a review by the National Survey of Residential Care Facilities, there are now 31,000 plus assisted living communities nationwide (Rosenbaum, 2011). The assisted living facility has not been required to document the residents' conditions in such detail prior to the shift to the medical model. Nurses have been hired in place of medical technicians to provide nursing care to meet the needs of the patients' more complex health care conditions. Nurses are currently documenting their assessments in paper charts similar to what the acute care facilities used to use. The assisted living facilities are now experiencing the issues of utilizing a dated documentation system such as limited accessibility, incomplete and inaccurate documentation of assessment, a lag in provider communication with regards to trending a patient's condition, and an increase in the time it takes for the nurse to document care and assessment.

Assisted living settings are almost exclusively governed by state regulations and laws, not federal rules, and vary from state to state; however, in 2014, the Centers for Medicare and Medicaid Services established requirements for assisted living facilities that receive payment for service from Medicaid. These requirements include maintaining records of "specific information/data elements, for example: demographic; history of present illness including, active diagnoses, functional status, medications; reason for transfer and past medical/surgical history", be exchanged with the receiving provider at the time of discharge from the facility (Kruse, Mileski, Vijaykumar, Viswanathan, Suskandla, and Chidambaram, 2017p.15).

An EHR is a digital version of a patient's paper records. EHRs are real-time, patient-centered records that make information available instantly and securely to authorized users

(Atherton, 2011). Paper health records are standalone, unable to automate data collection and sorting, or streamline provider workflow, information organized by electronic documents allows staff to ensure validity, reliability, and offers consistent accessibility.

Paper records are not able to integrate with other paper forms of information. Digital, unlike paper-based healthcare information can be integrated with multiple internal and external applications (Leonard & Sittig, 2007). Standardized documentation using EHRs typically include charting templates with intuitive prompts to ensure that nurses review and chart all pertinent clinical information and may provide clinical guidance alert to risks. EHRs with database functionality allow users to enter information in one part of the chart and direct that information to other sections for auto-documentation as clinically indicated, such as the Resident Assessment Instrument (RAI)/Minimum Data Set (MDS) (Leonard & Sittig, 2007). This is a substantial time-saving feature that will free the nurse, so he/she has more time to spend with the patients as well as save on costs related to over-time caused by documentation in paper charts.

Quality may be measured in terms of structures (S), processes (P), and outcomes (O). Structural measures are the facility's characteristics associated with the provision of care. Process measures are characteristics of things done to and for the patient. Outcome measures are the desired states one would (or would not) like to achieve for the patient (Sittig & Singh, 2010). There is limited access to the patient record when utilizing paper charts because only one person at a time may use the chart and the chart must be in a single location. This may present a risk of forgetting to chart information if another member of the staff has the file, the staff requiring access to the record must wait until it is available for their use and remember to go back and enter their data. Medical errors may be made if the staff makes decisions based on inadequate information, or lack of information that was not charted because the staff member failed to remember to enter their

documentation. In EHRs there are ques that can remind staff of such, in the event that they do not remember to enter their notes.

The ability to sort data fields in a paper record must be done manually. There are limitations to the physical quality of paper records. The quality of the actual documentation varies based on the nurse's documentation skills and knowledge level. While standardization of the data documentation has improved over the years, not all nurses use the same abbreviations, terminology, format, or chart organization. This can result in incomplete or inaccurate healthcare data collection. Handwritten information may be illegible, creating the potential for errors in patient treatment or medication orders (Keller, Kelling, Cornelius, Oni & Bright, 2015).

There are many significant barriers to implementation that must be addressed by leadership before committing to adoption of standardized assessment documentation using EHRs. Before transitioning to an EHR system, facilities must identify and dedicate appropriate administrative and medical personnel to work on implementation. As nurses become more comfortable with an EHR system, learned dependence on built-in clinical decision-making tools may risk critical human decision-making, leading to medical error (Singh, Schiff, Graber, Onakpoya, & Thompson, M. J, 2017). Simple actions made possible through computerized record keeping, like copy and paste, may cause a typing error to be copied repeatedly, leaving a long trail of mistakes that could potentially lead to medical error (Müller-Staub, Needham, Odenbreit, Lavin, and Van Achterberg, 2007). The cost of EHR systems is one of the largest contributory factors of failed widespread adoption. One of the primary issues that is still unresolved is who pays for the implementation of an EHR system, as it is currently health care payers that see the most benefit (Foraker et al. 2015).

Problem Statement

Despite current handwritten documentation in patient charts by nurses, there is delayed communication to the medical provider (Poissant, Pereira, Tamblyn, and Kawasumi, 2005). There is a lapse of time from when the nurse documents in the chart to when the doctor is receiving the information, unless the nurse takes an additional step and contacts the provider via the phone. This creates a 3-step process in the handwritten patient record method: Data collection, data charting and data transfer to provider. Current methods used by nurses to capture documentation of patient's physical health assessment are not complete or accurate, leading to potential medical errors because charts are used as a guide by providers to establish treatment plans (Poissant, Pereira, Tamblyn, and Kawasumi, 2005).

Lack of complete and timely documentation, limited accessibility, lack of analysis features, and inconsistent charting style are currently occurring at assisted living facilities (Holroyd-Leduc, Lorenzetti, Straus, Sykes, & Quan, 2012). A direct cause of this problem is the utilization of the handwritten patient chart (Brown, 2005). Currently at an assisted living facility, the nurse spends up to an hour to complete a physical assessment. This takes time away from implementing patient care. Perhaps a review of studies which investigate nursing standardized assessment documentation using EHRs by a translational paradigm could remedy the situation?

Purpose Statement

The purpose of this DNP project is to implement an EHR system in an assisted living facility to improve chart completeness of nursing assessments, improving the time it takes for the nurse to complete patient physical health assessment charting.

Project Question

To determine if the implementation of an EHR system project will positively impact patient chart completeness and reduce the time spent documenting in an assisted living facility. The following question was formed using the PICO format:

The goal of this project is to (P) understand nursing staff's charting incompleteness of patient physical health assessment (I) implementing an EHR system (C) compared to handwritten nursing documentation (O) to identify which method streamlines chart completeness, and timeliness (T) within the time of this DNP project.

Goals and Objectives

By the end of this DNP project, the following objectives will be met:

Improve patient record completeness:

- Implement EHR system in an assisted living facility
- Assure successful patient assessment navigation of EMR system
- Increase completeness of health assessments

Improve timeliness of charting:

- Decrease time spent by nurses documenting patient health assessments
- Increase accessibility of the medical record for the interdisciplinary team
- Improve interdisciplinary communication of patient conditions

Identify best practices for integration of EHR at an assisted living facility

- Implementation and use of non-bias literature and nursing theory

Coverage & Justification

Implementation of a wide-range search was conducted utilizing PubMed and Touro University of Nevada E-Library catalogue database, Cumulative Index of Nursing and Allied

Health (CINAHL) and subject specific professional websites: Centers for Medicare and Medicaid Services https://www.cms.gov, and Office of the National Coordinator for Health Information Technology: U.S. Department of Health and Human Services https://www.healthit.gov/ for retrieval of complete regulation publications. To assure use of the most appropriate resources were applied, inclusion criteria were established, limiting publication searches between 12/6/2010 and 8/16/2017. Search terms applied included: Handwritten patient charts, assessment charts, electronic health records, illegible medical notes, charting, charting errors, accuracy, charting completeness, patient records, and assisted living documentation. Exclusion criteria for sources included studies that were published in a language other than English, articles covering studies conducted outside of the United States and studies published before 2010. This search provided 178 sources including peer reviewed articles, government data, and best practices. Review of the abstracts and data assisted in distinguishing the 34 most applicable literature that related closely to DNP project topic.

Review Synthesis

Inaccurate and Incomplete Documentation

The literature illustrates that handwritten assessment records lead to data entry inaccuracies and incomplete patient charting, increasing nurses time spend entering information and delays in interdisciplinary communication, presented via application of randomized control trials (Holroyd-Leduc, Lorenzetti, Straus, Sykes, & Quan, 2012, Baron, 2007, Holroyd-Leducet et al., 2012, Keller et al., 2015, Poissant et al., 2005, Foraker et al., 2015).

Evidence-base literature presents a major causation of data entry error and lack of completeness is due to variations in handwritten charting styles, omitting data, and limited accessibility (Swihart, 2002). Variations in handwritten patient charts include use of

abbreviations, cursive verse print, misspelling, and illegible handwriting. Omitting data is the failure to include pertinent information in a patient's chart (Swihart, 2002). This alarming rate of inaccuracy and incompleteness has led to the need to identify evidence-base best practices to obtain optimal data entry accuracy, completeness, reduction of time spent charting, and ease of information exchange process among providers. Overall, studies of nurse-accessible EHRs suggest improvements in doctor-nursing communication, adherence and empowerment (Swihart, 2002). In contrast to the use of paper records, EHRs are perfectly legible.

Chart Accessibility

Limited accessibility of handwritten charts is due to the handwritten chart only being available to one staff member at a time and at one location. The literature uses descriptive studies to demonstrate patterns of repetitious occurrences in relation to variables such as omitting information, data entry errors, and documentation illegibility (Wager, Lee and Glaser, 2011, Swihart, 2002, Singh et al., 2017, Ross & Lin, 2003, Kahn, 2012). Combined, these variables make up close to 70% of the causes of charting errors (Wager, Lee and Glaser, 110). EHRs can be viewed repeatedly and in the context of rich sources of medical information available. This may potentially increase the potency of the intervention (Ross & Lin, 2003).

Perception of EHRs

Currently literature confirms a divide in nurse's perception of the use of EHRs. DesRoches, Donelan, Buerhaus, and Zhonghe (2008), conduct a national cross-sectional study surveying nurses and nurse leaders. These researchers found that reasons healthcare organizations that adopt EHRs is likely due to their belief that this technology will improve the quality of healthcare and patient outcomes. Conversely, the survey showed the reason organizations do not adopt EHRs is because they believe not enough improvement to the quality

of healthcare will be achieved. In a descriptive qualitative study, Doran, Jeffs, Rizk, Laporte, Chilcote & Bai (2014) investigate barriers that prevent older nurses from practicing bedside. Among barriers identified in the study, intimidation of electronic use was a consistent concern. Foraker et al. (2015), identified that overall, nurses are worried about how they enter information into patient charts and the lack of uniformity in handwritten documentation, limiting ways to best assure accuracy and completeness. Nurses understand that accurate and complete charting is critical to positive patient outcomes and request tools to provide better safeguarding and management of patient health records (Chin & Sakuda, 2012; Bowman, 2013; Gregory & Radovinsky, 2012).

Current Recommendations

Improving patient assessment documentation brings forth many areas for quality improvement to increase accuracy and completeness of records, decreasing time spent charting, and streamlining communication and workflow (Rajasekar, 2015). Among these improvement areas that the facility will need to assure, include system's cost of installation and maintenance, staff training on EHR use, changes in policies to manage electronic data, security and HIPPA compliance, which will need to be carried out by the assisted living facility in order to assure a sustainable practice change (Ajami & Arab-Chadegani, 2013).

Summary

The literature provides vast evidence that there is a need for platforms to have strong well-developed transition strategies to successfully move from handwritten charting to an EHR system (Sittig and Singh, 2010; Brown, 2005; Foraker et al., 2015; Kruse et al., 2017; Leonard et al., 2007; Sittig et., 2010). The literature documents that EHRs increase accuracy and completeness of patient records (Brown, 2005; Foraker et al., 2015; Holroyd-Leduc et al., 2012;

Keller et al., 2015, Kruse et al., 2017; Leonard et at., 2007; Makoul et at., 2001; Manca, 2015; Müller-Staub et al., 2007; Poissant et al., 2005; Baron, 2007; Sittig et al., 2010). The literature states that EHR use aims to stimulate ongoing discussions to increase understanding of the usability, safety and effectiveness of EHR systems. The adoption of EHRs will lead to safer and better-quality care. Electronic documentation systems offer features that are created to increase quality and utility of clinical documentation, enhancing communication among providers. These EHR systems address traditional requirements principles for documentation, supporting expansive new technologies. (Middleton, Bloomrosen, Dente, Hashmat, Koppel, Overhage, Zhang, 2013; Sittig et al., 2010; Poissant et al, Gupta, 2015; Makoul et al., 2001).

Needs Further Investigation

There is an abundance of support for the use of an EHR as illustrated in the literature however, additional research is required on best systems to use for assisted living facilities. Review of the literature proves that EHRs can increase accuracy and completeness of patient health assessments, reduce time spent charting, and improve interdisciplinary communication, however, there is limited literature that focuses on the best EHR systems to use at assisted living facilities (Brown, 2005).

Lastly, because time will be reduced documenting in patient charts due to use of EHRs, a secondary benefit may be the reduction in over-time, therefore, indirectly saving on the nursing department budget (Bar-Dayan, Saed, Boaz, Misch, Shahar, Husiascky, & Blumenfeld, 2013). The research methods utilized by the authors of this literature review vary from use of both qualitative surveys, cross-sectional studies, improvement projects, and literature reviews. Application of qualitative methods were utilized to illustrate data capturing accuracy and completeness in health records (Kruse, Mileski, Vijaykumar, Viswanathan, Suskandla, and

Chidambaram, 2017). Review of the literature shows that the United States government supports the use of EHRs and has developed programs and to encourage such. Healthcare platforms use and management of EHRs using qualitative methods were reviewed to obtain relevant data (Poissant, Pereira, Tamblyn, and Kawasumi, 2005). Qualitative methodology, which focuses on objective measurements as well as statistical and mathematical analysis of data collection aided in the quest to understand the practicalities of EHR systems in relation to data accuracy and completeness; optimizing time spent during the data sharing process to thoroughly understand current improvement required (Poissant et al).

Using an adaptive clinical trial, Gupta (2015) illustrates that use of EHR improves data capture and management. Gupta identified that paperless processes might require significant changes to existing procedures, however, remains in the best interests of facilities to remain competitive; leading to a consistent and streamlined workflow. Gupta states that all major regulatory authorities also advocate adoption of paperless records; hence the adoption of this framework should be the goal (Gupta, 2015).

An adaptive clinical trial is a study that evaluates a measurable control system was examined by observing participant outcomes on a set schedule and modifying parameters of the trial protocol in accordance with observations. The goal of an adaptive trial is to quickly identify things that have a positive outcome, and to zero in on populations for whom implementation is appropriate.

Leonard & Sittig (2007) applied correlational qualitative method of research to illustrate improvement to usability and cost reduction regarding application of software features. To establish meaningful measurements Leonard & Sittig (2007) assured that in their study the size and type of hospitals, number of beds and the type of IT utilized remained consistent within peer

groups tracking. It was concluded that the effects of health-related IT on the health care industry present improvement in data capturing and patient outcomes. (Leonard & Sittig, 2007). Correlational-quality methods aim to resolve the extent of a connection between two or more variables, applying statistical data. In this design method, relationships among various facts are sought and interpreted, which is key to identifying the best ways to adapt EHRs in assisted living facilities (Holroyd-Leduc et al. 2012, Keller et al., 2015, and Makoul et al., 2001). This article furnished innovative sources to review and investigate EHRs and its administration process.

Last, Richard (2007) and Kahn et al., (2012) are improvement projects, which consist of systematic and continuous actions leading to measurable improvement in health care services and patient outcomes. Application of the previous evidence-based guidance was utilized to implement EHRs, improving data accuracy and completeness. These projects illustrate that EHR-integrated platforms will provide truly advanced solutions revolutionizing clinical care, and bring forth significant benefits to stakeholders, health systems, patients, industry, researchers and society.

EHR quality improvement efforts present a current need for data capturing method change from handwritten health assessments and staff buy-in to its adoption and usability. In order to best understand this multi-layered healthcare concern, study methods must include qualitative methods using adaptive clinical trials and correlational-quality methods to tackle implementation of EHR in an assisted living facility.

Significance of Evidence to Profession

Evidence presented in the literature is crucial to the nursing profession to improve the accuracy and completeness of patient health assessments, streamline interdisciplinary communication, and reduce the nurses time spent charting; which will improve patient outcomes. Nurses are an integral part of the interdisciplinary team. As such, streamlining communication

amongst the team members will increase collaboration to provide an efficient method to deliver quality patient care. Documenting the patient condition accurately and utilizing current best practices not only improves patient outcomes but increases the respect from the interdisciplinary team members for the nursing profession.

Theoretical and Conceptual Framework

Theory Identification and Historical Development

Kurt Lewin's Change Theory model will be used as a framework for the implementation of this DNP project. Kurt Lewin is known as the father of social psychology. Born in Germany, he later emigrated to the United States and became well known for his literature on group therapy and social psychology (Bozak, 2003). Lewin's field and change theory concepts, emphasize that the group differs from the simple sum of its parts and that for change to occur the equilibrium must be shifted by driving forces (Bozak,2003).

Application of Theory to Current Practice

In the Change Theory, a three-stage paragon of change known as unfreezing-change-refreeze model, requires previously learned beliefs and practices to be rejected and replaced. Unfreezing is the identification of the required change; specifically, for this DNP project, implementing an EHR system to achieve accurate and complete assessment documentation. In this step a key concept is communication with stakeholders including nurses, managers and administration. Bozak (2003) states that for successful implementation, it is important that the lines of communication remain open, creating a "sense of security and trust in all those involved with the proposed change" (Bozak, 2003). The inclusion of nurses at the facility in key decision-making processes will promote a feeling of empowerment. In turn, this will help to overcome any resistance to the change from handwritten heath assessment charting to EHR, enable the

nurse to understand the importance of the project, and how it will beneficially affect patient care (Bozak, 2003). The refreezing phase is hardwiring the use of EHR in documenting assessments, utilizing it to improve interdisciplinary communication in care delivery, and indirectly improve patient outcomes.

Major Tenets of Theory

In the Change Theory, the model developed by Lewin represents a practical model for understanding the change process. In the Change Theory, the process of change entails creating the perception that the change is needed, and presents the need to moving toward a new behavior/ application and last, solidifying the new behavior/ application (Spetz, Burgess & Phibbs, 2012). Through recognition of these three distinct stages of change, a plan to implement the change required can be put into action. It starts by creating the motivation to change (unfreeze) (Spetz, Burgess & Phibbs, 2012). The process then moves through the change stages by promoting effective communications to embrace new ways of working successfully (change). And the end stage of the process ends, establishing a sense of stability (refreeze) (Spetz, Burgess & Phibbs, 2012).

Unfreezing

In the unfreezing stage, restraining forces will be addressed to help identify barriers that may need to be overcome. In the assisted living facility, restraining forces include aversion to using a new system, staff resistance to use a computerized method of documenting, workarounds, lack of computer experience, and lack of trust in the software (Spetz, Burgess & Phibbs, 2012). Driving forces are forces that will help move the project to completion such as; adequate financial investment, support from upper level management, ease of using EHR system, and better time management. In this stage it is important the project lead actively engages all

staff to work towards promoting the positive driving forces and minimizing the restraining forces so the EHR will be successfully adopted without the use of dangerous workarounds and full nursing investment in the outcome (Spetz, Burgess & Phibbs, 2012).

The nurse's relationship with self is central to the application of the Change Theory framework, because buy-in to the use of EHR software it crucial to minimize barriers to adoption. The Change model supports facilities to strengthen and transform these relationships to achieve desired quality and organizational outcomes (Koloroutis, 2004).

Change

The moving stage is the period of actual change; including implementation of the DNP project. Implementing the use of an EHR system in an assisted living facility will require efforts from different teams, of which include; information technology (IT), nursing, clinical nurse educators, and administrators (Koloroutis, 2004). A project like this will affect these departments in different ways, hence planning an effective roll out with the assistance and inclusion of all stakeholders is key. To proactively involve nursing staff, Bozak (2003) recommends providing nurses with platforms to gain ownership of the success of the project such as, open table discussions and recommendations, which will create a feeling of connection and buy-in. Some areas to consider at this assisted living facility are implementation timelines, effects on workflow, reliability of the equipment, educational training needs, organizational culture and leadership (Spetz, Burgess & Phibbs, 2012). In this stage a challenge includes discovering the use of workarounds that can be resolved through further education.

Refreezing

In Lewin's theory, this final stage is the process of freezing the changed practice, leading to stability and evaluation" (Bozak, 2003). During this stage continued support to the

stakeholders must be ongoing until the change desired is complete, and the nurses are comfortable with the technology. An evaluation and summary of problems and challenges encountered throughout the project should be completed for future reference once the change is completed and fully operational (Bozak, 2003).

Restraining Forces.

Restraining forces counter the driving forces of change, and hinder change by steering the nurses in the opposite direction. Restraining forces create an unplanned shift in the equilibrium which is opposite to the wanted change (Burnes & Cooke, 2013).

Driving Forces.

In the Change Theory, driving forces push towards a path that causes a desired change to occur. Driving forces facilitate change because they push personnel in the required direction, causing a shift in the equilibrium to achieve the desired change (Burnes &Cooke, 2013).

Equilibrium.

Equilibrium is a state of being where driving forces equal restraining forces and no change occurs. Equilibrium can be raised or lowered by changes that occur between the driving and restraining forces (Burnes & Cooke, 2013).

Building a Framework for Professional Nursing

Review of the Change model introduced ways to improve safety, quality, and nurse satisfaction by improving communication within the assisted living facility (Koloroutis, 2004). The Change model recognizes that Theory of Change is a comprehensive illustration and description of why and how a desired change is expected to happen. Its main objective is to map out or fill in the missing middle between what a change initiative does and how it leads to desired goals (Koloroutis, 2004). The model shows that nurses must constantly adapt to a variety of incremental changes in their workflow and their emotional responses can inhibit

planned changes from being effectively sustained. Implementing meaningful change requires supporting the nurse to find value in the desired goal. By using Lewin's change management process, an approach that has benefits for supporting and sustaining changes in practice can be effectively implemented (Koloroutis, 2004).

Application of Theory to the DNP Project

For application of this DNP project, it is imperative to have a complete plan in place for ultimate success. Using Lewin's Change Theory to guide the implementation of an EHR system in an assisted living facility; this framework will promote acceptance by involving nurses in all aspects of planning and implementation (Mehrolhassani & Emami, 2013). Creating this 'buy in' from nurses builds autonomy and ownership of the project, ultimately leading to success. The use of in-services to identify driving and resisting forces is a first step in this process. Next, addressing restraining forces will promote adoption to ensure the smooth implementation of the EHR system, resulting in reduction of charting accuracies and incompleteness (Mehrolhassani & Emami, 2013). Too often, administration implements new changes and nurses are forced to change practice with no opportunity to give input, eroding their trust in leadership over time. Using Lewin's Change theory, will reduce stakeholder resistance and fear of change through the development of a well thought plan for transition to use of an EHR system and active participation in the change process (Mehrolhassani & Emami, 2013).

Unfreezing.

Early in the change process, it is essential to take time to create a shared vision and understanding to build a common language among nurses (Weiner, 2009). A shared vision allows for leveraging resources toward the same end goal and problem solving all flowing in a common desired direction. Co-creating is a method that can produce a shared vision. Working

as a team to identify barriers, opportunities and to co-create interventions supports a shared vision, this may be established during planning sessions, while staff are in the unfreezing stage (Weiner, 2009). To provide a smooth transition from unfreezing to change, meetings with staff will be held to explore the need for this change. In addition, in order to gather pertinent baseline data, interviews will be conducted to identify both driving and restraining forces. Success of EHR implementation, overcoming restraining forces, at the assisted living facility will require regular honest communication and feedback from the nursing team during this initial phase (Weiner, 2009).

Restraining Forces

Restraining forces will inhibit successful implementation of this DNP project, for they act to decrease change. Restraining forces include nurse buy-in to the benefits of EHRs, prohibitive cost of technology, lack of IT Management, poor maintenance of equipment and technology illiteracy (Burnes & Cooke, 2012).

Driving Forces

Driving forces such as increased productivity, better collaboration, incentives and improved patient outcomes will positively influence the desired change of this DNP project, and keep it going successfully in the nursing department (Burnes & Cooke, 2012). The driving forces will decrease frustration with the current handwritten documentation, decreasing time spend charting patient health assessments and increase data entry accuracy (Burnes & Cooke, 2012). These driving forces will be key contributors to the success of this project; eliminating the restraining forces, empowering nurses to actively engage and support the change from hand written to electronic documenting.

Change

Personal mastery, which are principles and practices that allow a person to learn, envision, and view things objectively will enable nurses to see what behaviors and practices are needed to approach change (Lehman, K, 2008). This is accomplished by identifying what is important and continuously learning how to assess reality in relation to progress toward change. When nurses start to share experiences, insights, and knowledge with each other, team learning will occur. The discussions, reflection, an inquiry developed at this point form the basis for creating change and acceptance of the EHR system (Lehman, K, 2008). By engaging the nurses and having them provide their input will best assure that this DNP project is a collaborative effort. Establishing a partnership with key stakeholders will promote ownership over the change process positively impacting success and sustainability of EMR use at the assisted living facility.

Refreezing

Team learning allows for information exchange, problem solving and feedback. As nurses worked as a team, the group moved toward the refreezing stage of the Change theory (Lehman, K, 2008). The refreezing stage establishes stability and changes can then be accepted and become the new norm of the facility (Lehman, K, 2008). Having the opportunity to include the stakeholders throughout the steps of this DNP project will establish positive outcomes and continue this nursing model's evolvement in the assisted living facility.

Equilibrium

Before change in patient health assessment documentation can occur in the assisted living facility, the status quo must be upset- by either adding favorable conditions to the change or decreasing resisting forces. Kurt Lewin stated, that if the driving forces are stronger than restraining forces, the status quo will change (Mehrolhassani & Emami, 2013). It is the project

lead's goal as a change agent to support the driving forces so that the facility can obtain equilibrium, by outweighing the impact of the restraining forces. This will provide support while moving through the 3 stages of change.

Summary

Kurt Lewin Change theory demonstrates that to move a facility from point A to point B we first must develop motivating reasons to change. Next, implement all necessary changes, and last stabilize the operation at a higher level of performance. The application of the Change theory will provide a solid outline that will assists in the visualization, planning and management of this DNP project.

Description of Project Design

The following project will apply a quality improvement (QI) design to develop, implement, and evaluate an educational program for long term care staff on EHR documentation and to determine if implementing an EHR system in an assisted living facility would result in improved completeness of nursing assessments and streamline the time it takes for the nurse to complete initial patient health assessment charting. The project design will incorporate quantitative data analysis seeking to find reoccurring common themes among the data utilizing nominal and interval data. Data collected from the implementation of the project's design tools will be tabulated to present results of the different variables in the data set. This will provide a comprehensive picture of what the data looks like, assisting in the identification of patterns.

Thorough execution of the EHR system is needed to assure positive adoption, which will include an educational session for participants first to provide an overview of the benefits of EHRs and second, to provide a refresher on the navigation of the health assessment component of the software.

The project lead will oversee the training of participants and provide support during this time by being available to troubleshoot and answer questions. The objectives will be measured by utilizing pre and post implementation questionnaires to determine the participants' attitudes regarding documentation in EHRs. The participants will be timed in how long it takes to complete an initial health assessment using both handwritten assessment and the EHR assessment software. This project design will achieve this project's objectives by providing appropriate tools to draw measurable results. The pre and post electronic record implementation questionnaires will provide project lead with insight to participants buy-in and comfort using the EHR system.

Population of Interest, Setting, Stakeholders and Recruitment Methods

Population of Interest

This DNP project will involve 10 staff nurses from the second floor who compose and utilize patient health assessments, currently utilizing handwritten method at a New York City assisted living facility. All members of the inclusion group have been employed at facility for over 12 months and vary in age from 26 to 65. The nurses are RNs that have between three and eleven years of experience. Two of the nurses hold their associates degree and the other eight have their bachelor's degree. The inclusion group has been established based on their direct access to and use of patient health assessment charting. The other five floors at the facility were excluded because they specialize in more skilled care and are not employed and operated by host site.

Setting

This project will be conducted in a New York City assisted living facility, on the second floor which is a 40 bed unit offering skilled nursing, assisted living, and home care. The average

resident has been at the facility for over one year. The 217 bed facility offers six different high-quality care options including independent living, assisted living, home care, memory care, skilled nursing and continuing care. The facility strives to uphold its residents common values to be recognized as individuals, with the ability to lead their lives with a sense of purpose, maintaining connections with people and interests that are meaningful to them.

Stakeholders

The New York City assisted living facility's Administrator and Director of Nursing support the induction of an EHR system and accepted its implementation for the DNP project. They recognized the potential of EHR to help improve patient record completeness, and timeliness of charting.

Important stakeholders, including facility administration, nurses, physicians, physical and occupational therapists, and the patients on the second floor of this assisted living facility have been identified. Stakeholder roles will vary, but each will be integral in the success of the project and its evaluation. Administration would be sponsoring and advocating for the project with a clear message about the need for improving the completeness and timeliness of patient charting, specifically the initial patient health assessment the focus of this DNP project. The nurses will work to improve their knowledge and skills of the EHR system, so they could then successfully use the software. The physicians, physical and occupational therapists are members of the care team that will be able to utilize the EHR to conduct their assessments and charting, however are excluded from this DNP project. The patients will be able to have their data captured and shared amongst their care team simultaneously, since these patients are receiving skilled care that involves different health care professionals. The shared goals of the project are to increase knowledge of EHRs and its management, improve patient record completeness, and

timeliness of charting.

Recruitment Methods

In alignment with procedures to protect privacy and confidentiality of participant data, the method that would be applied is the development of internal sourcing, utilizing nurses from within the facility. According to Farrugia, Petrisor, Farrokhyah, and Bhandari (2010) establishing a none biased approach when identifying the desired population is a necessary procedure that must be carried out with care. When conducting an evidence-based practice change, selection of participants is primarily focused on accessibility to the population of interest, literature, and PICOT question to be addressed. To ensure generalizability and validity of the results, studies suggests that participants must be representative of the targeted population to which results will be applied.

Nursing Staff

A convenience sample of (N = 10) staff nurses will be selected. Utilization of a convenience sample will be applied because this is a QI initiative focusing on staff employed at the practice site. Inclusion criteria for this evidence-based project included: (a) nursing staff employed at host site for more than one year, (b) date of birth between 1962 and 1992, establishing a close representation of the nursing age population at host site (c) holding at least an associates in nursing, licensed to practice in New York without restrictions (d) and have a basic command of technology. Exclusion criteria includes (a) personnel not contracted by host site (b) nursing staff with less than 1 year employment by host site, because the project requires staff with sound understanding of the paper chart process to compare to the EHR process (c) nurses that are not licensed in the state of New York without restriction and (d) nurses without any command of technology and (e) CNA staff, because they will currently not be utilizing the

EHR system so they will be excluded from this DNP project..

Recruiting nursing staff that are employed within this project site is a benefit because the employees already understand how the organization operates. They have experience with the work culture and day-to-day tasks. The host site nurses are familiar with the documentation process and have a solid understanding of the facility's procedures. As incentive for participation, the host site's administration has offered to provide a financial bonus to those who partake in the project. The incentive will be equivalent to the financial compensation provided for participation in facility in-services, which is their hourly pay rate. To gain participant awareness of recruitment for this DNP project, approved flyers (See Appendix J) will beplaced in the second floor nursing station and break room at host site with DNP project subject, inclusion criteria and where to obtain more information.

Chart Audits

Inclusion criteria for the charts audited will be measuring the patient initial assessment, which contains the patient's demographics, mental health status, functional abilities, quality measures, nutrition, durable medical equipment, systems assessment, skin check, cognitive exam, pain scale, plan of care and nursing note. Charts will be selected (a) based directly on chart documentation completed by participants utilizing design tools during the execution of DNP project (b) all second floor patients that nurse participants have documented both handwritten and electronic assessments on. Excluded criteria are the (a) patient charts not located on the second floor (b) patients that have not had handwritten or electronic documentation of their initial health assessment completed by a nurse participant utilizing design tools during the execution of DNP project, (c) nurse charting of daily progress notes (d) follow-up assessments (c) discharge assessment. .

The audit will take place in the host site class room located on the first floor of the facility. The process for obtaining the paper charts will be by selecting charts that have recorded chart time by project lead specifically initial patient health assessments conducted by participants. Retrieval of handwritten records will be completed by signing out the charts in the unit record log. The project lead will access the electronic initial patient health assessments completed by project participants by utilizing the "Analysis Folder" setup by IT. The project lead will employ audits of both handwritten and electronic charts to assure that all files are audited the same, avoiding variation in chart audit grading and evaluation.

Tools/Instrumentation

The assessment tools for this project will be placed in project proposal Appendix

Chart Audits

. Chart audits are often used as part of a quality improvement initiative and why it was selected for this DNP project. The chart audit tool will be scored by adding the number of items answered complete and incomplete and dividing the number of complete answers by the number of items answered complete or incomplete to obtain a percentage (Tuffaha, Amer, Jayia, Bicknell, Rajaretnam, & Ziprin, 2012). The project lead will utilize the tool to document finding of participating nurses initial patient health assessment using EHR and handwritten charts. Each nurses will complete two patient health assessments providing 20 records for auditing, 10 EHR and 10 handwritten. Using the chart audit tool (See Appendix C), the project lead will evaluate all inclusion charts to avoid bias. Scores from audit will be used to measure project completeness outcomes. The time spent completing patient initial health assessments is a key measure of the DNP project. The time tracking component (See Appendix D) of the DNP project will show whether participants are able to successfully execute and complete the

assessment in a more timely manner using electronic record charting in comparison to handwritten. This is valuable information both for nursing leadership and the organization as a whole. To measure the time it takes for participants to complete the pre handwritten and post electronic patient health assessments, the DNP lead will have all participants send electronic notification at the start and conclusion of all project inclusion assessments.

Nurse's Attitudes

Staff at host site currently have access to the EHR system however, are not currently required to utilize it to capture patient's initial health assessments. As a result they have basic familiarity of its use but may be resistant to change in their documentation platform. An EHR pre- implementation questionnaire (See Appendix A) and EHR post-questionnaire tool (See Appendix B) will be utilized to gauge participant's impression of its use prior to and post education and utilization; specifically addressing the completeness and time taking to chart on the EHR system. Permission was obtained by stratishealth (See Appendix G)

Educational Presentation

The DNP lead will utilize educational material including PPTs (See Appendix I), and handout (See Appendix 1) to provide participants with specific information that will develop their understanding of the purpose, application and benefits of utilizing an EHR system while engaging in an in-service presentation. One PPT focuses specifically on the 10 step implementation process to transitioning to an EHR system, the second PPT covers information specific to the program that will be utilized at host site, and the handout provides user friendly steps to navigating the system. All training tools are specifically geared towards key aspects of the DNP project including the need for change in documentation technique and how to utilize the software.

Project Site Approval

The host site administrator was provided a summary of the DNP capstone project and request for approval and support for the proposed program; he has graciously approved and agreed to provide support for this DNP project to be conducted in the assisted living facility. (See Appendix E).

Data Collection Procedures

The project lead will construct frequency and percent distributions in order to organize the tabulations of scores located in each category of the EHR pre-implementation questionnaire (See Appendix A) EHR post implementation questionnaire (See Appendix B) patient health assessment audit tool (See Appendix C) and time tracking (See Appendix D). Mean, median, and minimum and maximum descriptive statistics will be applied to calculate and describe the data sets. As well as standard deviation/range to contextualize the sample data. Proceeding tabulation, data will be explored by disaggregating it across different variables and subcategories of variables. In addition to the methods described above, analytical procedures applying SPSS will be performed. These include: The McNemar test to measure the results from the patient initial health assessment audit and paired t-test test to measure the time it takes for participants to execute completing paper and electronic charts, as well as the McNemar test to analyze the data from the participant's pre and post electronic implementation questionnaires.

Chart audits

To collect data after recruitment; issues concerning the project's application will be identified, a planned approach implemented and methods applied by executing participant initial health assessment chart audit (See Appendix C) of handwritten and electronic documents for completeness as well as time tracking (See Appendix D) of both charting types for timeliness.

The chart audits will be performed during the implementation process approximately one or two weeks after implementation to allow the nursing staff time to familiarize themselves to the navigate the EHR. The chart auditing tool will be utilized to determine if all the components of the initial assessment is completed by using a yes or no statistic. Chart auditing consist of measuring a clinical outcome or a process, against facility standards set on principles of evidence-based practice in order to identify the changes needed to improve patient care outcomes (Esposito Dal Canton, 2014). Facilities are constantly working to utilize best practices for quality control, and proper allocation of resources. Chart auditing tools are one of the most popular and widespread (Esposito & Dal Canton, 2014). Time Management is essential, especially when nurses are faced with complex daily workflows. The ability to streamline the time spent charting will provide nurses with more direct bedside patient contact. The result of good time management is increased productivity and effectiveness. Time will be tracked (See Appendix D) via electronic notification by participants of the start and completion of handwritten and electronic assessments. The result of good time management is increased productivity and effectiveness. Time will be racked (See Appendix D) via electronic notification by participants of the start and completion of handwritten and electronic assessments.

Nurse's Attitudes

Nursing staff will provide feedback on the EHR system based on their current and post impressions of the software use. The pre implementation EHR questionnaire (See Appendix A) will consist of 15 questions utilizing a Likert scale, and the post EHR implementation questionnaire (See Appendix B) will consist of 20 questions, and additional five questions focused on training outcomes also utilizing a Likert scale.

Project Timeline

The following timeline outlines a week by week journal of the DNP project implementation process:

DNP Project Implementation Timeline	
Week 1	Send reminder notification to nursing participants regarding the educational training of the electronic software application
Week 2	Implement educational training utilizing the educational tools (See Appendix I) Over the proceeding two weeks participants will be provided time to learn the software prior to completing the EHR chart audit and time assessment Implement paper chart audit for completeness and monitor the timeliness of assessment documentation using the paper charting system Implement pre EHR implementation questionnaire (See Appendix A)
Week 3-4	Monitor status of the participants use of the electronic documentation system. Provide support by rounding and addressing any questions or concerns
Week 5	Implement electronic chart audit for completeness (See Appendix C) and timeliness (See Appendix D)
Week 6	Implement post EHR implementation questionnaire (See Appendix B)
Week 7-8	Analysis and evaluation of project tools data
Week 9-10	Dissemination to stakeholders, instructors, and student colleagues

Human Subject's Protection

Quality Improvement (QI) projects utilize evidence-based practice to improve care in practice settings, implement change, advocacy, promote the collection of information from the project plan, and evaluate the results (Melnyk & Fineout- Overholt, 2011). The DNP project will be directed towards quality improvement activities specifically related to an evaluation process within an assisted living facility that involved facility nurses. The project should be exempt from

Institutional Review Board (IRB) review since it is considered a QI project.

The project lead has successfully completed all required Collaborative Institutional Training Initiative (CITI) program modules for human subject research. The CITI program promote the public's trust in the research enterprise by providing high quality, peer-reviewed, web-based educational courses in research, ethics, regulatory oversight, responsible conduct of research, research administration, and other topics pertinent to the interests of member organizations and individual learners.

In order to maintain and protect the data of project participants, all participants will be assigned a unique code that will not be provided to any other participant or stakeholder. This will ensure the data provided by participant remains anonymous to all, excluding project lead. To uphold the privacy of participant and patient, host site IT department will create a folder on the server named " Analysis Folder" which will be password protected, as a secondary safeguard all participants and patient will be listed under their assigned unique code in this folder. There will be no patient identifying information extracted during the chart audit for the project use.

Plan For Analysis and Evaluation

Patient Initial Health Assessment Audit Tool

The initial patient health assessment audit tool consist of measuring a clinical outcome or a process, against well-defined standards set on the principles of evidence-based practice in order to identify the changes needed to improve the quality of care (Esposito, & Dal Canton, 2014). To evaluate the data collected from the patient initial assessment audit tool for completeness of the handwritten and electronic charts, the McNemar's test will be the tool utilized. McNemar's test is a statistical test used on paired nominal data. The McNemar test is used to determine if there are differences on a dependent variable between two related groups (Fagerland, Lydersen,

and Laake, 2013).

Time Tracking Tool

To accurately monitor the time it takes for nurse participants to document utilizing handwritten and electronic charting, project lead will require that electronic notification be sent at the start and conclusion of each initial health assessment completed during project. Project lead will apply SPSS paired t-test to measure the time data collected in order to analyze outcomes. The handwritten times will be identified as the pre EHR implementation times (See Appendix D), and the electronic times will be identified as the post EHR implementation times (See Appendix D).

EHR Pre and Post Implementation Questionnaire Tools

The pre implementation and post satisfaction questionnaires (See Appendix A and B) will present an opportunity for staff nurses to provide their feedback regarding EHR prior to use and again after education and utilization. Questionnaires are a tool in which inclusion groups may present their views on issues that indicate how well or how badly a project is received. Questionnaires are a valuable tool, helping user gain a better understanding of their audience requirements and concerns in order to improve project outcomes (Tuffaha, Amer, Jayia, Bicknell, Rajaretnam, & Ziprin, 2012). By addressing user satisfaction and responding to said problems, positive changes can be made to ensure employee buy-in as well as abilities to successfully utilize the EHR program successfully utilize the EHR program. To measure the outcome of the questionnaires the number associated with each answer will be tallied and placed in order from least. The results will provide key feedback on the EHR system, specifically focusing on the user perception, benefits, and challenges encountered while charting patient health assessments electronically. Result produced by both questionnaires will be measured

utilizing SPSS McNemars test to determine if there are differences on a dependent variable between two related groups (Fagerland, Lydersen, and Laake, 2013).

Data Analysis

Statistical analysis of data through application of SPSS McNemar and Paired t-test will provide DNP lead with specific data outcomes directly related to the relationship among paper and electronic charts completeness and timeliness. Measurement tools including the patient health assessment audit tool, pre handwritten time tracking, and post electronic time tracking which will be implemented after EHR training is implemented. Because nurses vary in the time it takes for them to successfully chart, an acclimation period after EHR introduction will take place during weeks three and four of the DNP project. In addition, the participant sample will be stratified so that each nurse is identified and equal number of charts initial health assessment data are collected to conduct paired testing. Evaluation of the results from the chart audits, time tracking observation and questionnaires will be assessed to determine the overall outcome of this DNP project. Upon collection of data, project lead will implement statistical analysis utilizing SPSS McNemar, Paired t-test, standard deviation/range, and descriptive statistics including mean, median and range. This will provide specific outcomes regarding the relationship among paper and electronic charts to completeness and timeliness. Utilization of the stated 4 tools will insure that the project objectives are thoroughly measured utilizing industry best practice to evaluate the outcomes.

Significance to the Nursing Profession

Information technology, specifically health information technology in relation to electronic health records has the capability to improve patient health assessment charting completeness, timeliness and overall quality assurance data collection in efforts to reduce health

disparities (Furukawa, Raghu, & Shao, 2010). Several studies of nurses perceptions and preferences regarding the use of EHRs have been conducted and examined in this project's literary review. Researchers generally find that nurses accept this technology and believe it will have a positive effect on patient health outcomes (Furukawa, Raghu, & Shao, 2010). EHRs use at assisted living facilities will provide a platform to assure timely and complete of charting patient initial health assessments. This can aide in the delivery of higher quality safe care for patients. Utilization of EHRs at assisted living facilities can help personnel better manage care, resulting in better outcomes, providing accurate, up-to-date, and complete information about patients at the point of care. This allows personnel the ability to quickly access patient files for efficient care, securely share electronic information, help providers effectively diagnose patients, reduce medical errors, and provide safer care (Baron, 2007).

In 1992, the American Nurses Association (ANA) identified nursing informatics as a specialty "that integrates nursing science with multiple information and analytical sciences to identify, define, manage, and communicate data, information, knowledge, and wisdom in nursing practice."(5). Nurses play a vital role in all aspects of the Health Information Technology (HIT) lifecycle. The roles of the nurse is key in the use of EHR technology. This is supported by ANA's position, which states that clinical nurses must be involved in the selection, design, development, implementation, evaluation, and improvement of EHRs used in patient-care settings(Gomes, Hash, Orsolini, Watkins, & Mazzoccoli, 2016). The clinical information accumulated in EHRs can be utilized in data analysis to produce new nursing knowledge, creating an environment where nurses interact with electronic information to promote and obtain the best possible patient outcomes.

Analysis of the Results

The execution of this project involved the implementation of the patient physical health assessment using an EHR format to replace the paper chart in an assisted living facility. The purpose for this project was to reduce documentation time and improve the completeness of the assessment as well as to understand the nurses' aptitude and acceptance of the change from handwritten to electronic charting (Manca, 2015). The data analysis results suggest there are statistically significant differences in charting time duration and completeness with the transition from handwritten to electronic documentation. The analysis of the nurses' KSA pre and post EHR implementation questionnaires, however, showed no significant differences in the outcomes.

Timeliness of Documentation

A paired t-test was used to compare the time it took a nurse participant to complete a patient physical health assessment using handwritten technique versus electronic technique. This test was recommended because it is used to compare changes in numeric responses (e.g. time) before and after intervention implementation (Nahm, 2016). For nurse participant results (See Appendix L).

Paired sample t-test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre	56.9500	20	12.65525	2.82980
	post	42.4500	20	6.40292	1.43174

Paired Samples Test

	Paired Differences				t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			

				Lower	Upper			
Pair 1	pre - post	14.50000	13.90002	3.10814	7.99459	21.00541	4.665	19	.000

The analysis conducted demonstrated a significant difference in the time taken to document a patient physical health assessment using the handwritten approach versus the EHR. The mean time for the handwritten method was 56.95 minutes while the average time for completion of the health assessment using the electronic method was 42.45 minutes. This implies that there is a mean difference of 14.5 minutes between the two methods. However, there is a need to determine if the mean difference is statistically significant. This is done by assuming that the mean difference is not different from zero as the statement of the status quo. This decision can only be arrived at by using the mean and the standard error as parameters and basis of comparison. This was achieved by deploying the paired sampled t-test, which is a method for showing whether an intervention or new method is efficient, considering the fact that the same subjects (nurses) took part in the two phases of the DNP project (Fagerland, Lydersen, and Laake, 2013). Specifically, the handwritten method took significantly more time than the EHR. Notably, the true mean difference lies between 7.99 minutes and 21 minutes. This implies that when the same test is repeated several times, the mean difference between the handwritten method and the electronic method will lie between 8- and 21-minutes 95 percent of the time. This is shown by the confidence interval. The significance of this difference is shown by the t statistic ($t = 4.665$, $p < 0.05$), the p-value is less than the expected error of five percent. Therefore, there is sufficient evidence to conclude that the mean difference is greater than zero, hence the electronic method of documenting has proved to be much faster than the handwritten method of charting the patient physical health assessment (Esposito, & Dal Canton, 2014).

Physical Assessment Completeness

In order to compare the responses of the 10 nurse participants on paper and electronic charts completion (20 in total each) the recommended statistical testing applied was the McNemar test, which is used to compare changes in binary (e.g. "yes"/"no") responses before and after intervention implementation (Fagerland, Lydersen, & Laake, 2013). For nurse participant results (See Appendix K).

McNemar test

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50th (Median)	75th
pre_impleHR	20	.25	.444	0	1	.00	.00	.75
post_impleEMR	20	.90	.308	0	1	1.00	1.00	1.00

pre_implementation & post_implementation

pre_implementation	post_implementation	
	No	Yes
No	1	14
Yes	1	4

Test Statistics

	pre_implementation & post_implementation
N	20
Exact Sig. (2-tailed)	.001[b]

a. McNemar Test

b. Binomial distribution used.

Utilizing the patient physical health assessment audit tool, all sections of the assessment were audited for completeness. Any assessment identified with a section or sections that were not completed were marked as incomplete. Any assessment that had all sections completed was marked as complete. The results from the application of the McNemar's test shows that the

percentage of patient physical health assessment charts were less complete using the handwritten/paper method (25%) compared to now using the electronic charting method (90%). The percentage incompletion is significant. While only 25 % of the handwritten charts were complete, 90 % of the EHR was complete. This indicated a 65 % increase, which expresses the efficiency of the electronic charting method. The significance in this result means that based on a standard assessment, the completion of the electronic health record chart is more efficient compared to the handwritten record chart. The statistic McNemar test proves this ($N= 20$, $p < 0.05$). The p-value is the probability of making a wrong a decision when the null premise is actually true, which is 0.1 percent in this case (Rajasekar, 2015). As such, for every 1000 samples of size 20 taken, the likelihood of finding the handwriting method being better than the electronic method is just a single instance. Therefore, since the p-value is less than the expected error of five percent (0.05), it can be concluded there is sufficient evidence to say that the electronic method is more efficient compared to the handwritten method (Esposito, & Dal Canton, 2014). The second table is interpreted as follows; the bottom left cell of the table contains a 1, which means that after the introduction of the EHR method, one nurse did not show improvement, and actually indicated that the handwritten method was better compared to the EHR system. However, the top-right cell of the table shows that 14 of the nurses actually showed improvement from handwritten to EHR system, which is a positive result.

Nurses' Knowledge, Skills, and Attitudes

To compare the feedback from the nurse participants regarding their perception of the EHR system and how well they believe it met their needs regarding knowledge, skills, and attitudes pre-implementation and post-implementation of the electronic health record system, the McNemar test was applied (Boynton, 2004). The data were collected utilizing the EHR Pre-

Implementation Questionnaire Tool and Post-Implementation Questionnaire Tool. Response categories were tabulated to determine if the overall participant response was positive or negative. Neutral responses were added to both positive and negative results because they apply to both equally. For nurse participant results (See Appendix M).

The McNemar test

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
preEHR	10	.70	.483	0	1
postEHR	10	.80	.422	0	1

preEHR & postEHR

preEHR	postEHR	
	Negative	Positive
Negative	1	2
Positive	1	6

Test Statistics

	preEHR & post EHR
N	10
Exact Sig. (2-tailed)	1.000[b]

a. McNemar Test

b. Binomial distribution used.

Based on the analysis, there was no significant difference between the feedback on knowledge, skills, and attitudes pre-implementation and post-implementation of the electronic health record system. While 70 percent of the respondents were positive pre-implementation, only 80 percent were positive post-implementation. This implies that only 10 percent (1 nurse) changed their perception after the implementation of the EHR. The insignificance of this change in perception was confirmed using the McNemar test (Doran, Jeffs, Rizk, Laporte, Chilcote, and

Bai, 2014). The test is used to test whether paired proportions are significantly different. In this case, the test results indicated that for the N = 10 (10 related pairs), there was no difference between pre and post implementation of the EHR ($p < 1$). This p-value means that there is insufficient evidence to conclude that the perception of the nurses changed after implementation of the EHR (Boynton, 2004). The second table is interpreted as follows; The bottom left 1 means that only one of the nurses changed their perception from positive to negative towards EHR. The top right 2 means that only two nurses changed their perception from negative to positive towards the EHR system. The top right and bottom left cells add up to 3, which means only 3 nurses changed their perceptions, 1 from positive to negative and 2 from negative to positive. The other 1 and 6 indicate no change in perception.

The results obtained and analyzed are positively in line with the project outcomes showing statistically significant improvements in time duration and completeness in charting; suggesting the electronic platform had a positive impact. The insignificance in perception in the pre and post implementation phase is also a positive pointer towards successful adoption and utilization of the EHR. It also minimizes risk of change associated resistance that would be anticipated from the nurses. This cooperation from the nurses alongside the efficacy and effectiveness of the EHR system, as pointed out by the analysis, greatly enhances the facility's capacity and quality of service provision.

Discussion and Significance

This DNP project supported the implementation of an EHR program organized with a structured format to capture all data from the patient physical health assessment. Overall, despite only 10 nurse participants, there were positive aspects to the results. Most of the project participants were on board with the transition to electronic documentation pre implementation,

so there was minimal variation in the nurses knowledge, skills, and attitudes pre (70%) to post (80%) questionnaire. Both results showed an overall willingness of the participants to accept the software application at the facility. Of the objectives established, the project lead sought to ensure successful transition and participant buy-in to change from handwritten to electronic documentation (Doran, Jeffs, Rizk, Laporte, Chilcote, and Bai, 2014). The data shows that nurses were in fact accepting and in agreement of shift, meeting the project objective.

The handwritten and EHR patient physical health assessment charting methods were both utilized twice by the 10 nurse participants, providing a total of 20 records for each method. The project examined if one of the two charting methods, handwritten or electronic would improve the completeness of the patient's physical health assessment documentation. The completeness of the patient physical health assessment with the transition from handwritten to electronic documentation showed substantial improvement from 25% to 90% of the charts being filled out in its entirety post EHR implementation. The results infer that documentation completion using the electronic charting method significantly improved, meeting the project's second objective (Rajasekar, 2015). The data analysis results showed positive improvement in the duration of time it took the nurses to document when the electronic system was utilized, saving an average of 14.5 minutes (Fagerland, Lydersen, & Laake, 2013). Analysis of the results showed that timeliness was in fact improved when nurses utilized the EHR, meeting the project's third objective.

Discussion

This scholarly project sought to identify evidence-based resources to develop a quality improvement design project analyzing the time duration and completeness of handwritten and electronic patient physical health assessments while gauging the nurses knowledge, skills, and

attitudes towards the EHR pre and post implementation. Materials for this quality improvement design project included evidence-based literature of EHR usability, EHR weekly meetings to update management, up-to-date EHR resources and collaboration with the stakeholders of this project.

Staff nurses were able to perform all functions of the EHR patient physical health assessment evidenced by their ability to successfully navigate the features and functions of the software after the in-service training, which was a component of this DNP project (Rajasekar, 2015). The 10 nurses who attended the in-service were asked to give a pre and post implementation feedback of the electronic software. The feedback questionnaires were applied because the literature suggest that when implementing a change it is key to measure participants' knowledge and perception during a change process (Rajasekar, 2015). Differences in the outcomes for the questionnaires were relatively small because participants had general support of utilizing electronic charting. In addition, a stakeholder meeting consisting of the director of nursing, the director of information technology, a nurse educator, and a staff nurse participant were asked to give feedback of the project to determine its effectiveness at the facility.

According to the feedback, the project conformed to the quality standards established by the facility for which this project was implemented. The feedback provided also concurred that the project was in alignment with the objectives for meaningful use of EHR adoption by long term assisted living facilities (Fagerland, Lydersen, and Laake, 2013). In addition, management stated that the project provided tools that were helpful in enhancing staff nurses understanding of EHR usability. Findings from the meetings contributed to the conclusions that are supported in the current literature. Data collected from the application of the project design described the usefulness and relevance of this DNP project. This data suggested an association between

nurses' use of the EHR system and their improvement in charting timeliness and completeness after going live with the electronic physical health assessment chart. This finding is similar to research conducted by HealthIT (2013), also supporting the project objectives, which found that efficient utilization of EHRs by nurses will enable them to chart effectively and efficiently. Research conducted by Menachem and Collum (2011), found that EHR use by nurses reduced charting time and errors due to its capability to alert end-users about data entry mistakes. Nurses reported that they were able to complete charting in a shorter time duration utilizing the electronic record because certain information such as the patient's name and DOB auto filled throughout the electronic document, participant's did not have to waste time making sure their penmanship was legible nor did they have to check their grammar because response were provided by checking off applicable field cells. Chart completion was improved because the electronic record would not allow participants to move forward to the next section of the physical health assessment if required fields were not completed. This software safeguard generated an increase in record completion by 65% utilizing the EHR.

The host site commented that the project was in alignment with the objectives for meaningful use of EHRs adoption at their facility. The findings of this DNP Project are also similar to research conducted by DesRoches and Colleagues (2008) which found that nurses who worked in facilities with EHRs were more likely than other nurses to report higher quality documentation and more time to spend providing direct patient care.

The project mentor suggested that the project lead collaborate with nurse participants that had experience with EHRs or general technology to provide support to the nurse participants that did not feel comfortable using the software. Having the nurses that were comfortable with the use of the software work alongside the nurses that did not provided a positive means for

integration and minimized frustration with the change. There has never been an expectation that everyone that participated in the project was going to find the change easy. In fact, it was anticipated that some individuals might have needed additional guidance and support. Partnering those nurses with technology experience and those without greatly aided in the transition. This data suggested a correlation between IT support for nurses to effectively and efficiently chart electronically. This finding is similar to research conducted by Fuller (2009) that found that disciplines such as nursing, which are information intensive, require careful investigation into the use of computers to process nursing information, as well as training and guidance. Findings of this DNP project have a mutual correlation to the literature, supporting application of health industry best practices to improve patient health outcomes.

Significance in Nursing

Facility change

The project created an entire change in workflow for the nurse participants. To fully understand the needs of the nursing department, it was necessary for everyone involved to understand regulatory requirements and the necessary components of the project to ensure there was still reporting capability and clear, thorough documentation throughout the change process (Gomes, Hash, Orsolini, Watkins, & Mazzoccoli, 2016). The electronic documentation also needed to meet standards expected for facility Medicaid payment reimbursement. Any delays or major changes were communicated clearly and quickly. It helped to build trust, convey valuable information and ensure things ran smoothly (Baron, 2007). It was critical to provide full disclosure of all information both positive and negative related to the components of the EHR program to nurse participants and stakeholders, to ensure their trust in the software program.

Since the facility is planning to fully transition all sections of the patient file from

handwritten to electronic charting, the new EHR software program supports the merge to paperless charting and EHR utilization (Gomes, Hash, Orsolini, Watkins, & Mazzoccoli, 2016). Also, the implementation of the new software program has stimulated the nursing staff to further review and educate themselves on the interventions recommended in the facility guidelines to enhance their documentation timeliness and completeness. In addition, the use of an electronic software program had a favorable effect on nursing satisfaction and documentation compliance through the application of evidence-based best practice. Without the implementation of this software program, documentation practices concerning the patient physical health assessment would have remained as is. Nursing documentation of the patient physical health assessment would continue to be inconsistent with no uniformity. When notes are not fully documented, critical information can go unknown. This can compromise the communication of important information between nurses and other members of the patient's care team potentially placing the patient's health and safety at risk (AHIMA Work Group, 2013).

Industry change

The implementation and utilization of EHRs among healthcare organizations have resulted in monumental advantages. The effective and efficient use of EHRs by nurses is significant to health care practices. First, has allowed nurses to provide care in a safer and efficient manner. Second, has decreased the potential for documentation errors caused by poor penmanship and missing documentation. Third, according to HealthIT (2013), it has minimized the time nurses spend documenting in the patient's chart.

Research demonstrates an abundance of studies on EHR adoption, but few studies have been done on EHR software program in long term care facilities. Of the studies identified in this paper, positive outcomes resulted when EHR systems were customized and utilized to their

fullest extent (Chidambaram, 2017). Assisted living facilities use of EHRs still needs to be further explored, but this project serves as a means to shed light on the outcomes of electronic integration. The AHIMA Work Group (2013) reports that EHRs can improve the efficiency and legibility of documentation and improve time spent documentation (Farrugia, Petrisor, Farrokhyar, & Bhandari, 2010). These factors can contribute to the healthcare industry long-term care sector improving patient outcomes, error reduction and patient safety (U.S. Department of Health and Human Services, 2010). Nurses are encouraged to intervene and lead EHR design efforts to help meet the challenges and demands that come with implementing EHR technology across various healthcare platforms (Chidambaram, 2017).

This project was useful for the purpose of promoting documentation change at an assisted living facility. This project was designed to analyze the nurse's functional capability to utilize the EHR for effective charting by focusing on time duration and completion of the patient physical health assessment (Fagerland, Lydersen, and Laake, 2013). The results provided by this project has profound implication for nurses, and the nursing practice. Project implications include effective and efficient chart documentation through the use of EHRs and improved patient outcomes through the application of evidence based best practice (Chidambaram, 2017)

Limitations and Dissemination

Limitations

Project design. The project applied a quality improvement (QI) design because it is a systematic, data-guided activity aimed to bring about immediate improvements in health delivery; in line with the objectives of the project (Van Bokhoven, Kok, & Van Der Weijden, 2003). The design was applied to develop, implement, and evaluate if utilizing an EHR system

in an assisted living facility would result in improved timeliness and completeness of the patient physical health assessment.

The qualitative and quantitative data analysis project design sought to find reoccurring common themes among the data, however it presented limitations. The DNP project lead has identified, the collection of data was time consuming, and the sample size was small; and because fewer participants were observed project results was not possible to generalize to that of the overall long term care- assisted living population.

The project lead proposed a project timeframe that would assure project completion prior to the end of DNP III. It was identified though the project was executed within the time frame, more time would have provided the project lead with additional opportunities to conduct additional in-services and communicate more with participants and stakeholders (Manca, 2015). It is therefore recommended that future project timeframes provide three months to execute.

The participant sample size (10) for data collection affected the overall number of charts audited (20 handwritten and 20 electronic) and time duration data captured (20 handwritten and 20 electronic). Guest, Bunce, and Johnson (2006) propose that saturation often occurs around 12 participants in homogeneous groups or at least 15% participant representation of the population. It is therefore recommended that future studies increase the number of participants to 12 or 15% representation of the target population.

Research methods from the project design also proved to be difficult to make systematic comparisons such as participant answers that were subjective; including their perception of EHRs and personal productivity. It is recommended that future projects utilize objective questionnaires to avoid participant bias. Though QI design serves the point of applying purposeful efforts to secure positive change, the design is theory-rich and evidence-poor (Van

Bokhoven, Kok, & Van Der Weijden, 2003). Limited studies have been carried out to determine what health personnel actually do when they use quality methods or of the results. There is a lack of information that identifies if the methods or results are used to develop new policies, procedures or protocols in line with study outcomes. Little of the literature is based on health care experience, and even less is based on sound independent scientific research (Hulscher, Laurant, & Grol, 2013). It is possible that there is scientific research in other industries that does show evidence-rich results. It is unlikely that these tools would be widely used in industry if they did not produce results. However, unless they have been proven to work in health care, acceptance is low (Hulscher, Laurant, & Grol, 2013. The procedures by which the DNP Lead went about this project's work to identify changes in time duration, chart completion and nurse participant's attitudes and understanding of EHR was conducted to produce answers to the Who (nurse participants), What (charting duration time, completion and participant perception), Where (host site), When (during practicum-2-months), and How (implementation of EHR system) of the study , explaining and predicting the project's outcomes set forth in the project objectives.

Nursing staff data recruitment. The literature suggests to ensure generalizability and validity of project results, participants should be represent the targeted population to which results will be applied (Farrugia, Petrisor, Farrokhyah, & Bhandari, 2010). The project lead thus applied internal sourcing, utilizing nurses from within the facility. Participants were recruited utilizing evidence based best practice, which the project lead used to develop inclusion criteria including nursing staff employed at host site for more than one year, (b) date of birth between 1962 and 1992, establishing a close representation of the nursing age population at host site (c) holding at least an associates in nursing, licensed to practice in New York without restrictions (d)

and have a basic command of technology.

The participants selected for the DNP project were fully compliant with all project lead request and instructions for participation however, there were still some drawbacks. Disadvantages of the inclusion group included the inability of the DNP lead to determine ease of EHR use in unfamiliar settings and user unfamiliarity with the software. For instance, travel or contract nurses that do not have the advantage of knowing the facility or have complete training on the software. This may affect the time it takes them to complete their documentation as well as enter data in its entirety. Another identified limitation was that nurse participant's had familiarity with the physical health assessment content, and may have used the handwritten chart format as a base to navigate the EHR since the formats are similar. This may have aided in their ability to complete documentation on the EHR faster. It is therefore recommended that future projects include participants that are not familiar with the facility or the software to identify if the results are affected.

Chart audit data recruitment. The literature suggests chart audits are often used as part of a quality improvement initiative because it measures the quality of care so that clinicians can improve it, and why chart auditing was selected for this DNP project (Esposito & Dal Canton, 2014). Inclusion criteria for the charts audited measured all sections of the patient physical health assessment, which contained the patient's demographics, mental health status, functional abilities, quality measures, nutrition, durable medical equipment, systems assessment, skin check, cognitive exam, pain scale, plan of care and nursing note. The charts selected (a) were based directly on chart documentation completed by participants utilizing design tools during the execution of DNP project (b) and second floor patients that nurse participants have documented both handwritten and electronic assessments on.

Disadvantages of the chart audit included the lack of ability to determine a correlation of the results to patient health outcomes. There was no evidence that patient outcomes improved because nurses were able to document faster and produce more complete charts (Esposito & Dal Canton, 2014). Also, there was no way to determine if the documentation recorded by the nurse in the patient physical health assessment was directly translated into appropriate patient care planning. Lastly, the chart audit was very time consuming. The project lead spent approximately six more hours than the anticipated 20 hours (30 minutes per chart) conducting the audit. Staff in other facilities may not have the time required to complete the audit, which would limit their ability to conduct the project under its current design. It is recommended that future projects include project tools that identify timely and complete documentation's effect on patient health outcomes, determining if patient care planning improved, and more time provided to audit charts.

Pre and post implementation questionnaires collection method. Questionnaires were utilized as a collection method for the project because literature suggest that they are cost efficient, practical, produce speedy results, are scalable, and can be analyzed, which were all favorable advantages for this project (Boynton, 2004). The questionnaires proved to be a valuable tool however, there were some disadvantages identified. There was no way to determine if participants were 100 percent truthful with their answers. Dishonesty can happen for a variety of reasons, including social desirability bias and shame of providing responses that are not favorable. Another limitation identified was there was no way to know if the respondent had really thought the question through before answering. Answers may have been chosen before fully reading the question or the potential answers, effecting the data results. It is recommended that future projects focus on objective questioning to minimize bias responses, as

well as more time to complete the questionnaire to avoid participants from rushing through it without reading the questions and answers in full prior to responded.

Patient health assessment audit tool collection method. The facility's assessment auditing tool was utilized because as the literature suggests it measures a clinical process, against the facility's standards in order to identify if there are any needed changes in the documentation process to improve patient care outcomes (Esposito Dal Canton, 2014).

The patient health assessment audit tool was a beneficial collection method however, it too presented limitations. The facility patient health assessment audit tool was used to analyze the completeness of the charts, but the tool was originally setup to audit their paper records. The data measured for completeness was present in both handwritten and electronic charts however, there were additional features of the EHR, such as response dropdowns, medication reference tables and out of range alerts that the audit tool was not able to capture. This information would have been valuable to determine if there were any correlations between those features and the completeness of the EHR charts (Kruse, Mileski, Vijaykumar, Viswanathan, Suskandla, & Chidambaram, 2017). It is recommended that future project create an audit tool specifically for the EHR in order to capture additional features that would aide in identifying if there is any improvements related to their use.

Time tracking tool collection method. The time tracking tool was used to capture the duration of time spent by nurse participants documenting the handwritten and electronic physical health assessment. Literature suggest that time management is essential, for healthcare professionals and the result of good time management is increased productivity and effectiveness (Esposito & Dal Canton, 2014).

The time tracker successfully produced key project result data however, the project lead

identified that there were some disadvantages. The time tracker did not provide an opportunity for participants to report if there were interruptions, which as a result prolonged their charting time. The reported duration time spent documenting was also 100 percent reliant on the participants reporting accurately. There was no way for the project lead to identify if the time duration reported was the actual precise time it took them to complete the chart. It is recommended that future projects include an addition column on the time tracker to note if there were any interruptions and the time the interruption lasted. In regards to report accuracy, it is recommended that for future projects the lead directly observe participants charting and capture the times.

McNemar test and paired sample t-test data analysis. Data analysis techniques, included the McNemar test and Paired sample t-test, and though they provided valuable results, they each presented limitations.

The Paired sample t-test was applied to compare participant charting time duration using handwritten and electronic techniques to document the patient physical health assessment. This SPSS test was utilized to analyze the data because it was able compare the changes in numeric responses (e.g. time) pre and post EHR implementation (Nahm, 2016). The results from the Paired sample t-test showed that participants saved an average of 14.5 minutes utilizing the EHR. The test proved to be a useful tool however, there are limitations associated with using a repeated measures design instead of a between groups design. In particular, carry-over effects in the form of fatigue and practice effects need to be addressed. Another problem is the loss in degrees of freedom. The between groups t-test has $n_1 + n_2 - 2$ df (with two groups of 10, df = 18) whereas the repeated measures t-test has only n-1 df (with one group of 10, df = 9). As df gets lower, users need a higher t-value to reach significance (and therefore a greater treatment effect). Users

thus get a tradeoff between greater power and fewer degrees of freedom. It is recommended that both a repeated measure design and groups design be applied to analyze the full extent of the data.

The McNemar test was utilized because it is able to analyze pretest-posttest study designs (Westfall, Troendle, & Pennello, 2010). The SPSS test was applied to compare participant handwritten and electronic charts completion (20 in total each), which results showed an increase from 25% to 90% chart completion post EHR implementation. The test was also used to analyze pre and post EHR questionnaire feedback (Boynton, 2004). The results showed, there was limited variation in responses from participants with only a 10% change from 70% positive response to 80% positive responses post implementation. Disadvantages identified regarding the McNemar's test was that it is difficult to understand, which could lead to errors in output interpretation and is not fully appropriate to approximate the null distribution—a precise statement about a population that one tries to reject with sample data—of the test statistics distribution (Chin & Sakuda, 2012). A repeat analysis is recommended to address these limitations.

Additional limitations. Although efforts were made by the project lead to provide frequent updates to keep participants informed, it was identified that more communication would have better kept the nurse participants fully abreast of the project's progression. Bowman (2013) recommends many different communication channels to be used to share the benefits of change as well as any relevant communication. In-service time was problematic because the project lead had limited time to meet with participants. As a result they gave up their lunch break time to ensure in-service was completed, so more time for in-service is recommended for future projects. Participants were encouraged to practice using the sample database in the EHR software program

to make themselves more comfortable with the process prior to going-live, which many did not take advantage of. Future projects should build into the design required time utilizing the sample database. There were enough computers and ipads for the nurses, but issues with internet connection proved to be of concern when the EHR first went live. Facility IT was able to address the matter and strengthen internet connection in a timely manner. It is recommended that prior to going live, a test run be implemented to identify such issues. Some nurse participants lacked command over general technology use requiring additional guidance from other participants that were technology savvy (Manca, 2015). This limitation caused additional time constraints because the nurse participants that were comfortable with technology had to use their personal time to assist their counterparts that needed additional guidance. This was reported back to the project lead as a useful, but inconvenient intervention. It is recommended that future project include participants from the facility's IT department to support nurses that are not comfortable utilizing technology.

Dissemination

Internal. A roundtable meeting with facility stakeholders will take place on project lead's last day at host site 10/19/2018. All findings from the project will be shared to ensure that there is a full understanding of all aspects of the project's results and limitations. This will provide the stakeholders with an opportunity to address any final questions as well as provide full awareness of all project outcomes. It is important that the facility stakeholders are aware of the project outcomes so they may make well-informed decisions on whether or not to continue utilizing the EHR system at their facility and fully roll out the software throughout the entire building.

A meeting will also be held with the staff nurse participants that day in order to provide

them with feedback from the project including the data analysis results, project outcomes and limitations. Staff nurse participants as a result will be able to utilize this information to improve their overall nursing practice and job workflow.

External. In order to provide project findings to Touro University, Nevada (TUN) instructors a power point presentation will be utilized. The presentation will include an introduction to the project, its purpose and project question, the project plan, results and findings, and discussion with key conclusions. Dissemination to TUN instructors will provide project lead with the opportunity to receive critical feedback from experienced academic staff that can identify areas of the project that may better improve its results if carried out again at another facility. In addition, it also provides an opportunity for project lead to share evidence-base information that may be applied to their nursing practice.

TUN students will be able to listen in on the presentation allowing them the ability to learn about the benefits and limitations of an EHR in an assisted living facility. Peer evaluation is an important aspect to DNP projects because it provides the project lead and peers the chance to receive and provide value feedback on areas of the project that may be improved and may have contributed to one's own nursing knowledge.

Industry. To disseminate scholarly findings of DNP projects, conferences are essential. By attending conferences, nurses learn from others and improve their own skills and knowledge about the health field. It is also an important way to engage with other nurses, ask questions and distribute information that can be applied to better service patients in other facilities.

A way of disseminating findings from this scholarly project is by poster presentation during an annual conference. Participation and presentation during annual conferences has the potential to reach a wide audience. In addition, poster presentations target a more diverse

audience including those with practice, research, and community development interest (AACN, 2006). The project lead plans to attend the 3rd World Congress on Patient Safety & Nursing Healthcare (2441st of Conference Series LLC Ltd). The conference aims to discover advances in health practice opportunities and challenges for the nursing community, management and education in relation to health disparities as well as a breadth of other topics. The conference brings together nurses from various aspects of the nursing industry including those that work in long-term care settings. This provides a great opportunity for project lead to reach nurses that may directly benefit from being informed about the project and its outcomes.

For future projects of this nature, an examination of documentation practices and opinions from health care providers on EHR satisfaction and dissatisfaction can help identify what changes need to be made. Sample size, and time spend on pre and post implementation electronic software teachings may also improve integration results (Keller, Kelling, Cornelius, Oni, & Bright, 2015). These simple strategies can be the impetus for change.

Project Sustainability

As noted in Greenhalgh's (2005) systematic review, successful implementation of a new innovation requires both a receptive climate and a good fit between the project and intended population's needs. The application of an EHR system to analyze timeliness and completeness of the patient physical health assessment began with a simple question from the project lead: Will the implementation of an EHR system project positively impact patient physical health assessment chart completeness and reduce the time spent documenting in an assisted living facility? However, Greenhalgh (2005) also observed that changing practice can be a complex process and use of evidence based literature does not always lead to rational decision-making. Given that adoption of any new initiative is a process rather than an event, sustainability must

extend beyond establishing creating intent to change, translating intent into action, and diagnosing problems into eventual stabilization and sustainment (Greenhalgh, 2005).

The primary aim of this DNP project was to introduce the use of an EHR system at an assisted living facility. Based on Maynard and Steins' (2008) recommendations to pilot interventions on a small scale. The scope of system and small size within the host site offered the ideal environment to execute this project. The setting offered a receptive environment willing to implement the project in this vulnerable population of geriatric patients that could benefit from having their data captured electronically (Keller, Kelling, Cornelius, Oni, & Bright, 2015). Ideally, EHR software will become standard within the long-term care system. The project will be formally handed off to the host site Director of Nursing Operations for future sustainment and possible spread of use throughout the entire facility. Hopefully she will facilitate dissemination outside of the 2nd floor unit into the entire facility and beyond (Singh, Schiff, Graber, Onakpoya, & Thompson, 2017).

Despite the identified limitations, the DNP project demonstrated that there is clinical significance that exists on EHR program software utilization in regards to charting time and completeness. A beneficial clinical outcome was a reduction in documentation time, omissions and errors. Organizational outcomes, on the other hand, have included such items as operational performance and satisfaction among participant who used the EHR system. Lastly, societal outcomes include being better able to conduct and achieve improved nurse delivered health care(Singh, Schiff, Graber, Onakpoya, & Thompson, 2017).

Conclusion

With the continued drive to deliver safer and better quality care in assisted living facilities, there is a growing priority for many organizations to use EHR technology successfully.

Since a good portion of a nurse's time is spent documenting, nurses can provide valuable input on what works for user workflow. They are in key positions to help make EHR systems more efficient and user-friendly in the long-term care sector (Bozak, 2003). They can collaborate with key stakeholders such as administration and information technology department to overcome barriers as well as assist with EHR design and implementation. Optimizing EHR systems through the implementation of EHR software programs can support and facilitate data tracking (Bozak, 2003). EHR systems can also improve the legibility and efficiency of documentation, improve documentation practices, and enhance communication by providing complete and accurate documentation ((Bozak, 2003). Reduction in clinical documentation time through more efficient documentation processes, can provide the nurse with more time with their patients. These factors can contribute to improved patient outcomes, patient safety, and a reduction in errors (Burnes & Cooke, 2012). The findings from this project are important to nursing, providing evidence based best practices as means to merge to paperless charting in assisted living facilities. It is the goal of this DNP project to inspire other nurses to take steps in leading EHR implementation efforts to help to meet the many challenges and demands that assisted living facilities are currently facing with executing a successful change integration to electronic documentation.

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Appendix A

EHR Pre-Implementation Questionnaire Tool

EHR Pre-Implementation Questionnaire

Time needed: approximately 15 minutes Nurse Number:_____

EHR User Pre-Implementation Questionnaire

The purpose of this questionnaire is to obtain feedback on your perception of the EHR system and how well you believe it will meet your needs. Results will be compared with the post survey data as a benchmark and used to identify areas in need of improvement if applicable.

Instructions: Please fill in the number that best describes your response.

Please complete this questionnaire and return to: _____ by:_____

Check the column that most closely describes how you feel about each of the following statements	**Strongly Agree 1**	**Agree 2**	**Neutral 3**	**Disagree 4**	**Strongly Disagree 5**
1. EHR increase overall workflow efficiency					
2. Computerized alerts and reminders will be annoying					
3. Our clients/families will be OK with our use of EHR					
4. EHR will improve my personal productivity					
5. EHR will be difficult to learn how to use					
6. Use of EHR in front of residents will be depersonalizing					
7. EHR is not as accurate or complete as the paper record					
8. EHR will improve quality and client safety					
9. Once all documents are scanned into the system, we will have a complete EHR					
10. A first step toward a successful EHR is addressing workflow and process changes					
11. We are in an age where we must exchange data electronically with others. EHR will help us do this					
12. Health care is too complex anymore without access to clinical decision support provided by EHR					
13. EHRs are not as secure as paper records					
14. Facility cannot afford EHR					
15. EHR can have unintended consequences if we don't apply professional judgment in its use					

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Appendix B

EHR Post- Implementation Questionnaire

EHR Post Implementation Questionnaire

Time needed: approximately 15 minutes Nurse Number:_____

EHR User Post-Implementation Questionnaire

The purpose of this questionnaire is to obtain feedback on your perception of the EHR system and how well you believe it will meet your needs. Results will be compared with the post survey data as a benchmark and used to identify areas in need of improvement if applicable.

Instructions: Please fill in the number that best describes your response.

Please complete this questionnaire and return to: _____ by: _____

Check the column that most closely describes how you feel about each of the following statements	**Strongly Agree 1**	**Agree 2**	**Neutral 3**	**Disagree 4**	**Strongly Disagree 5**
1. The EHR has increased overall workflow efficiency					
2. Computerized alerts and reminders are annoying					
3. Our clients/families are OK with our use of EHR.					
4. EHR improved my personal productivity.					
5. EHR was difficult to learn how to use.					
6. Use of EHR in front of residents is depersonalizing.					
7. EHR is not as accurate or complete as paper records.					
8. EHR improved quality and client safety.					
9. Once all documents are scanned into the system, we did have a complete EHR.					
10. A first step toward a successful EHR was addressing workflow and process changes.					
11. We are in an age where we must exchange data electronically with others. EHR helps us do this.					
12. Health care is too complex anymore without access to clinical decision support provided by EHR.					
13. EHR is not as secure as paper records.					
14. Facility cannot afford EHR					
15. EHR had unintended consequences because we did not apply professional judgment in its use.					

Please rate the following concerning the EHR	**Better than Expected 1**	**Good 2**	**Acceptable 3**	**Poor 4**	**Worst than Expected 5**
a. Training					
b. EHR Assessment completion time					
c. Assessment completeness					
d. EHR Dependability					
e. Technical support					

Appendix C

Chart Initial Patient Health Assessment Audit Tool

Patient Chart Identification Code: _____ Active ( )

A section may only to be documented as complete if ALL questions are answered. N/A should be placed in any field that is not applicable to patient.

IDENTIFICATION	COMPLETE (Y) INCOMPLETE (N)	COMMENTS	NURSE INITIALS
Start of Care Date			
Demographics			
Mental Health Status			
Functional Abilities			
Quality Measures			
Nutrition			
Durable Medical Equipment			
Systems Assessment			
Vital Signs			
HEENT			
Neurological			
Cardio-Pulmonary			
GI/GU			
Musculoskeletal/Integumentary			
Plan of Care			
Skin Check **If There is report of alteration in skin, is the Body Chart completed?**			
Cognitive Exam **All questions must be answered, if patient cannot perform, is there a note explaining why?**			
Pain Scale **All questions must be answered**			
Nursing Note			
REVIEWED BY:			

Appendix D

Handwritten and Electronic Chart Time Tracking Tool

Participant	Handwritten Chart Code	Pre Implementation Time Handwritten Patient Health Assessment Start Time	Pre Implementation Time Handwritten Patient Health Assessment Completion Time	Electronic Chart Code	Post Implementation Time Handwritten Patient Health Assessment Start Time	Post Implementation Time Handwritten Patient Health Assessment Completion Time
Nurse 1						
Nurse 2						
Nurse 3						
Nurse 4						
Nurse 5						
Nurse 6						
Nurse 7						
Nurse 8						
Nurse 9						
Nurse 10						

Appendix E

Project Site Permission Letter

From: Philip Viar
Sent: Friday, April 27, 2018 5:40:01 PM
To: Raina Vandyke
Subject: RE: DNP Project

April 27, 2018

To Touro University Nevada DNP Program,

I, Philip Viar, Vice President of Avondale Care Group, LLC acknowledge that Raina VanDyke, RN, MSN is a current student enrolled in the DNP program at Touro University Nevada. Raina is approved to conduct her DNP Project at Avondale Care Group, LLC/ Brookdale Site to implement her DNP project on Electronic Medical Record Documentation. If you have any questions or concerns, please feel free to contact me at your earliest convenience.

Thank you,

Philip Viar
Vice President
The Avondale Care Group, LLC
505 8th Avenue Suite 200
New York, NY 10018
Tel: 646-254-6250 Fax: 646-727-4689
PhilipViar@avondale.pro
Home | Avondale Care Group

Appendix F

Project Site Tool Utilization Permission Letter

From: Philip Viar
Sent: Thursday, May 24, 2018 3:26:11 PM
To: Raina Vandyke
Subject: RE: DNP Audit Tools

May 24, 2018

To Touro University Nevada DNP Program,

I, Philip Viar, Vice President of Avondale Care Group, LLC grant Raina VanDyke, RN, MSN permission to utilize our agency's patient chart audit tool for the sole purpose of conducting her DNP Project on Electronic Medical Record Documentation at Avondale Care Group, LLC/ Brookdale Site.

If you have any questions or concerns, please feel free to contact me at your earliest convenience.

Thank you,

Philip Viar
Vice President
The Avondale Care Group, LLC
505 8th Avenue Suite 200
New York, NY 10018
Tel: 646-254-6250 Fax: 646-727-4689
PhilipViar@avondale.pro
Home | Avondale Care Group

Appendix G

EHR Implementation Tool Utilization Permission Letter

-------- Original message --------
From: Susan Severson <SSEVERSON@stratishealth.org>
Date: 5/30/18 9:52 AM (GMT-05:00)
To: dnp18c.raina.vandyke@nv.touro.edu
Cc: Deb McKinley <DMCKINLEY@stratishealth.org>
Subject: EHR and HIE Satisfaction toolkit

Hi Raina,

You have permission to use these tools for your academic project with acknowledgment.

Good luck!

Sue

Susan K Severson
Vice President, Health Information Technology Services
Stratis Health
Office (952) 853-8538
sseverson@stratishealth.org

Nicole Gackstetter, Executive Assistant, (952) 853-8512,
ngackstetter@stratishealth.org

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Appendix H

HealthIT PPT Education Material Permission

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Open Survey

Content last reviewed on February 8, 2018

Appendix I

Educational Tools

HealthIT PPT Presentation

Electronic health record (EHR) implementation

Ease the transition from paper to electronic health records

STEPSforward
POWERED BY THE AMERICAN MEDICAL ASSOCIATION

"We have turned the EHR into an ally rather than an adversary."

James Jerzak, MD
Bellin Health
Green Bay, Wisconsin

Adequate EHR implementation allows the practice to **adapt more easily** to a new system.

3

Front-hand preparation can lead to more **tangible downstream results**, benefiting patients, physicians and staff.

4

Ten steps to successfully implementation of the EHR program

1. Create an implementation team
2. Configure the software
3. Identify the hardware needs

5

Ten steps to successfully implementation of the EHR program

4. Transfer data
5. Optimize pre-launch workflows
6. Nursing Station layout

6

Ten steps to successfully implementation of the EHR program

7 Training Initiation

8 Facility launch approach

9 Procedures for when hardware is down

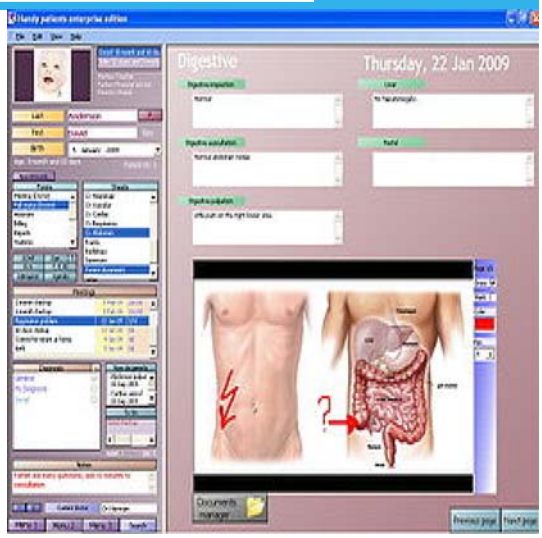
10 Facility mechanisms for ongoing learning and improvement

7

Important Aspects of Electronic Health Records

Strategic Planning
Records Management
IT Governance
IT Standards
IT Resource Websites
EMR Vendor Evaluation

User Training
Privacy
Security
HIPPA Analysis
Audit Tools
EMR Implementation

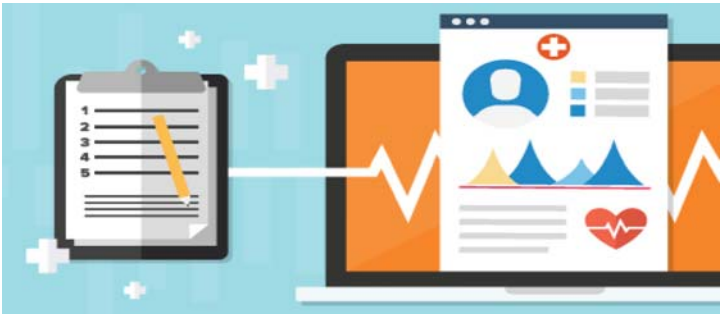


8

Computer Skills Evaluation and Assessment

The Computer Skills Evaluation and Assessment helps facilities plan for training needed to make staff comfortable with technology.

http://www.thenationalcouncil.org/wp-content/uploads/2012/10/Computer-Skills-Evaluation-and-Assessment.doc

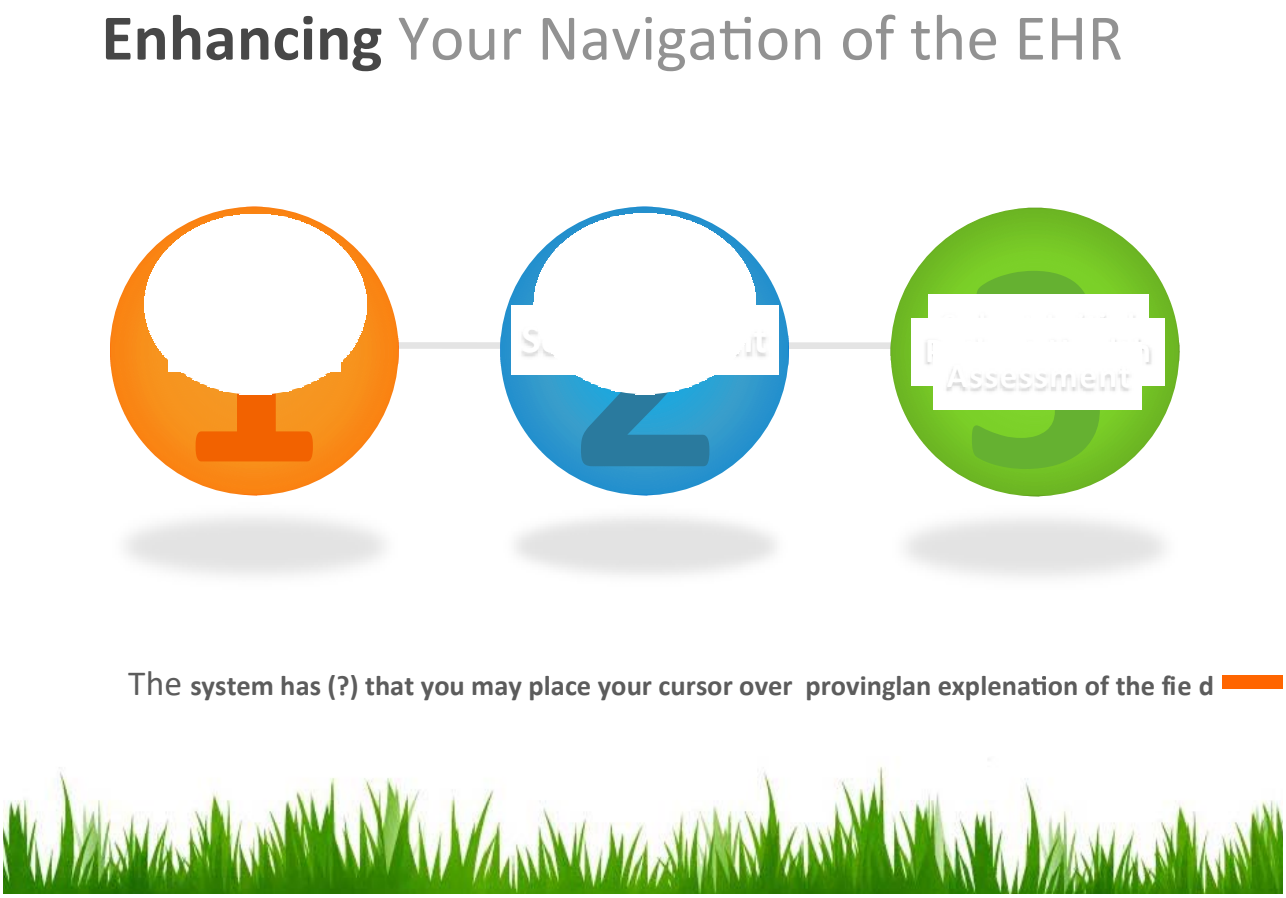


Get Ready, Get Set, Go…

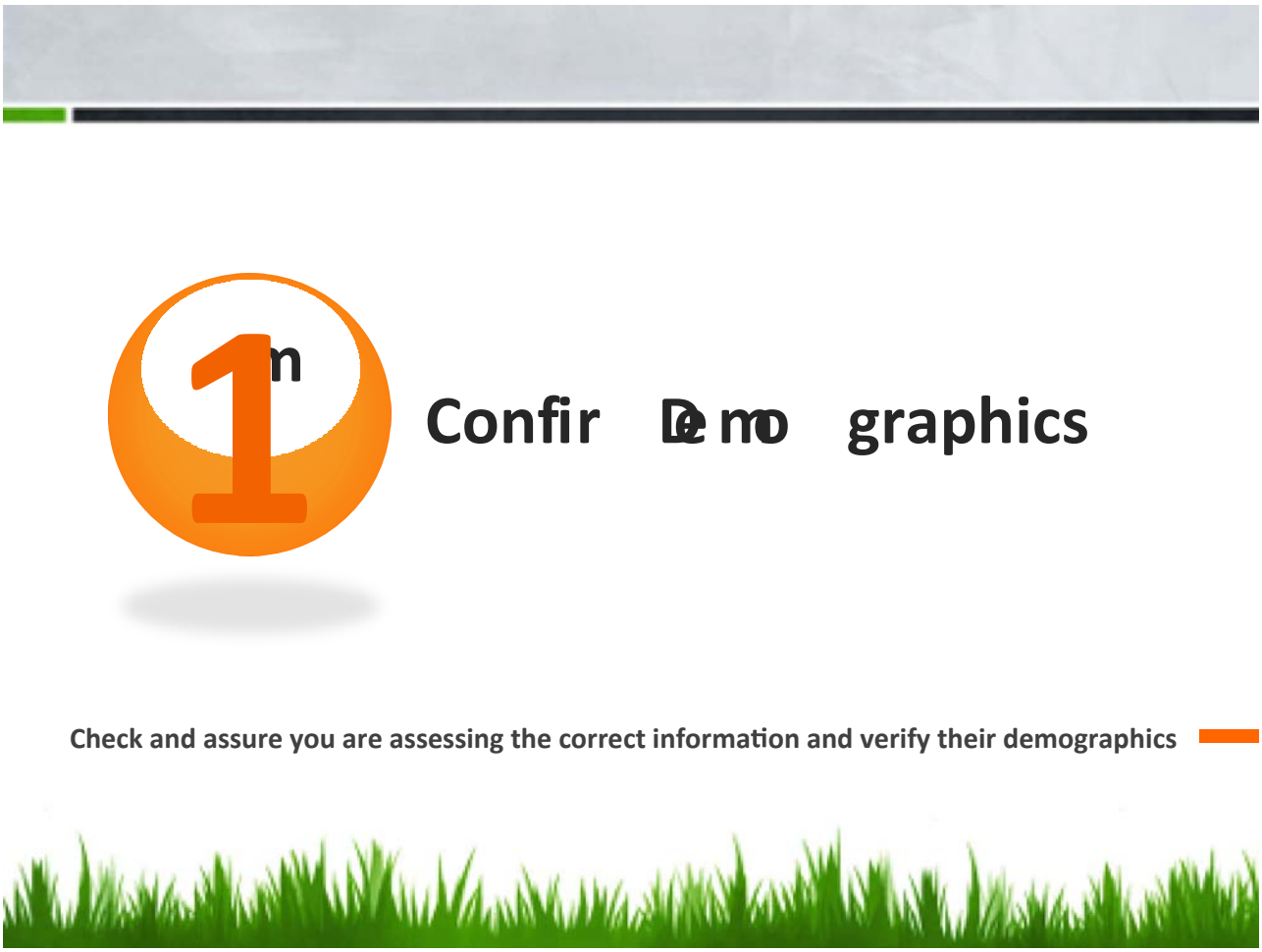
The strategies and tactics presented in this PPT will aid you in thoroughly understanding your facility's specific needs—from the team who will lead the rollout to the software and hardware options to the layout of your facility—to successfully implement an EHR.

DNP Project Lead Narrative:

Government healthcare initiatives are driving the move from paper-based to an electronic medical records program (EMR) with the objective to improve the quality and safety of care. Medical records technology offers healthcare facilities many benefits over paper, including more accurate and comprehensive information as well as instant access to patient files. In this presentation we will navigate your facilities EHR specifically focusing on the initial patient health assessment.



DNP Project Lead Narrative:
To enter the EHR system, utilize your user login name and unique password
Upon entry to the site you will be on the system home page, showing your unit Dashboard
It the top right corner you will see the *Search patient* tab
Select tap and enter the name of the patient you wish to complete your initial health assessment on



DNP Project Lead Narrative:

Before starting your initial health assessment, confirm that the information captured during intake is accurate

If any of the information has changed or was entered wrong, scroll to the bottom of the page and select edit

Go to the appropriate tab that requires editing and enter the correct information

After you have entered the correct information, scroll back down to the bottom of the page and select save

Getting Started

First Section of Assessment :

1. Mental Health Status
2. Functional Abilities
3. Quality Measures
4. Nutrition
5. Durable Medical Equipment

The system will not allow you to move on if there is a section not completed in the initial health assessment form.

DNP Project Lead Narrative:

The first section of the patient initial health assessment includes mental health status, functional abilities, quality measures, nutrition and durable medical equipment.

The system has safety features that will not allow you to progress if the form is not filled out in its entirety

Organize with Sections

Systems Assessment

Vital Signs
HEENT
Neurological
Cardio-Pulmonary
GI/GU
Musculoskeletal/
Integumentary
Plan of Care

DNP Project Lead Narrative:

The systems assessment will take you through the systems of the body flagging any data that is out of range

The system will not allow you to move past the flagged data unless you acknowledge the rationale for the value or

the intervention the nursing intervention that will be implemented to address it

DNP Project Lead Narrative:
After completing the system assessment section of the patient initial health assessment, the system will bring you to the tool page. Included in this section of the EHR, you will find the skin check, cognitive assessment and pain scale. Again all information must be completed before the system will allow you to progress.

Nursing Narrative.

DNP Project Lead Narrative:

After you have successfully completed the tools portion of the patient initial assessment, the system will prompt you to enter your nursing narrative. Here you will document you nursing note. Upon completing your note, scroll

down to the bottom of the screen and select complete.

DNP Project Lead Narrative:
At this time I would like to open up the floor to questions.

EHR User Education Guide Handout

Clinical EHR User Education Guide

Initial Assessment and Reassessment:

1) Click search from the *Reference Table Management* page
2) Click add, this will bring up the *Assessment Type* screen
3) Enter information in fields. Note:
    a. *Name*: Unique name for assessment, required field.
    b. *Abbreviation:* 4 Character Unique Abbreviation for assessment type, required field.
    c. *Description:* Free text field, easily identifies visit type.
    d. *Status:* Defaults to active. If an Assessment Type is inactivated it will remain assigned to assessment, but can no longer be selected for new assessments.

Clinical Documentation Reference Tables

There are 3 reference tables associated with clinical documentation

1) Lung Sounds
    a. Facilities can add lung sounds
2) PHQ-9 Scale
    a. Facilities can add action taken
    b. Score/Type and Description are not modifiable and are based on the PHQ-9 tool
3) DME & Supplies

User Management for Clinical Documentation

User Rights/Roles specific to clinical documentation: Facilities will determine which rights are assigned to users. Below is a list of rights with a brief description. There are five statuses to which documentation can be saved.

1) **In Progress:** Allows clinical documentation to be saved while in progress
2) **Completed**: Clinical documentation can only be saved after all required fields have been entered and all validations addressed.
3) **Office Review**: Allows clinical documentation to be saved in this status while reviewed by staff
4) **CG In Review**: Amendments required by clinician. Typically placed in this status after review.
5) **Reviewer Approved:** Documentation reviewed and completed

*Note: To add New Roles contact facility IT Support team, management approval require

Clinical EHR User Education Guide

To access role and rights

1) Click on *Admin* tab
2) Go to *User Management*
3) Click on Edit Roles
4) For Section Select "Patient"
5) For *Role* select the role to edit/update
6) Click *Search*

Scroll Down to Documentation: Save Options and Edit Features

Save eDoc InProgress: Allows save to this status
Save eDoc Completed: Allows save to this status
Save eDoc CG inReview: Allows save to this status
Save eDoc Office Review: Allows save to this status
Save eDoc Reviewer Approved: Allows save to this status
Add Clinical eDoc: Allows user to add electronic documentation (This is required for field staff)
Delete Patient Clinical eDoc: Allows user to delete electronic documentation
Edit eDoc InProgress: Allows user to edit/amend assessments in this status
Edit eDoc Completed: Allows user to edit/amend assessments in this status
Edit eDoc CG inReview: Allows user to edit/amend assessments in this status
Edit eDoc Office Review: Allows user to edit/amend assessments in this status
Edit eDoc Reviewer Approved: Allows user to edit/amend assessments in this status
View Patient Clinical EDoc: Allows user to view assessment
Save eDoc InProgress: Allows save to this status
Save eDoc Completed: Allows save to this status
Save eDoc CG inReview: Allows save to this status
Save eDoc Office Review: Allows save to this status
Save eDoc Reviewer Approved: Allows save to this status
Add Clinical eDoc: Allows user to add electronic documentation (This is required for field staff)
Delete Patient Clinical eDoc: Allows user to delete electronic documentation
Edit eDoc InProgress: Allows user to edit/amend assessments in this status
Edit eDoc Completed: Allows user to edit/amend assessments in this status
Edit eDoc CG inReview: Allows user to edit/amend assessments in this status
Edit eDoc Office Review: Allows user to edit/amend assessments in this status
Edit eDoc Reviewer Approved: Allows user to edit/amend assessments in this status
View Patient Clinical EDoc: Allows user to view assessments.

Clinical EHR User Education Guide

On the Confirmation page: Go to the right side of the page *Clinical Documentation Required*

A) **Clinical Documentation Required (Skilled Assessment):** If selected, all skilled assessments for this patient must have valid clinical documentation to pass and be accepted to officially save.

B) **Sufficient Documentation:** These fields will determine which types of Clinical Documentation are
sufficient to pass all required validations.
    i. If *Clinical Documentation Required* is selected:

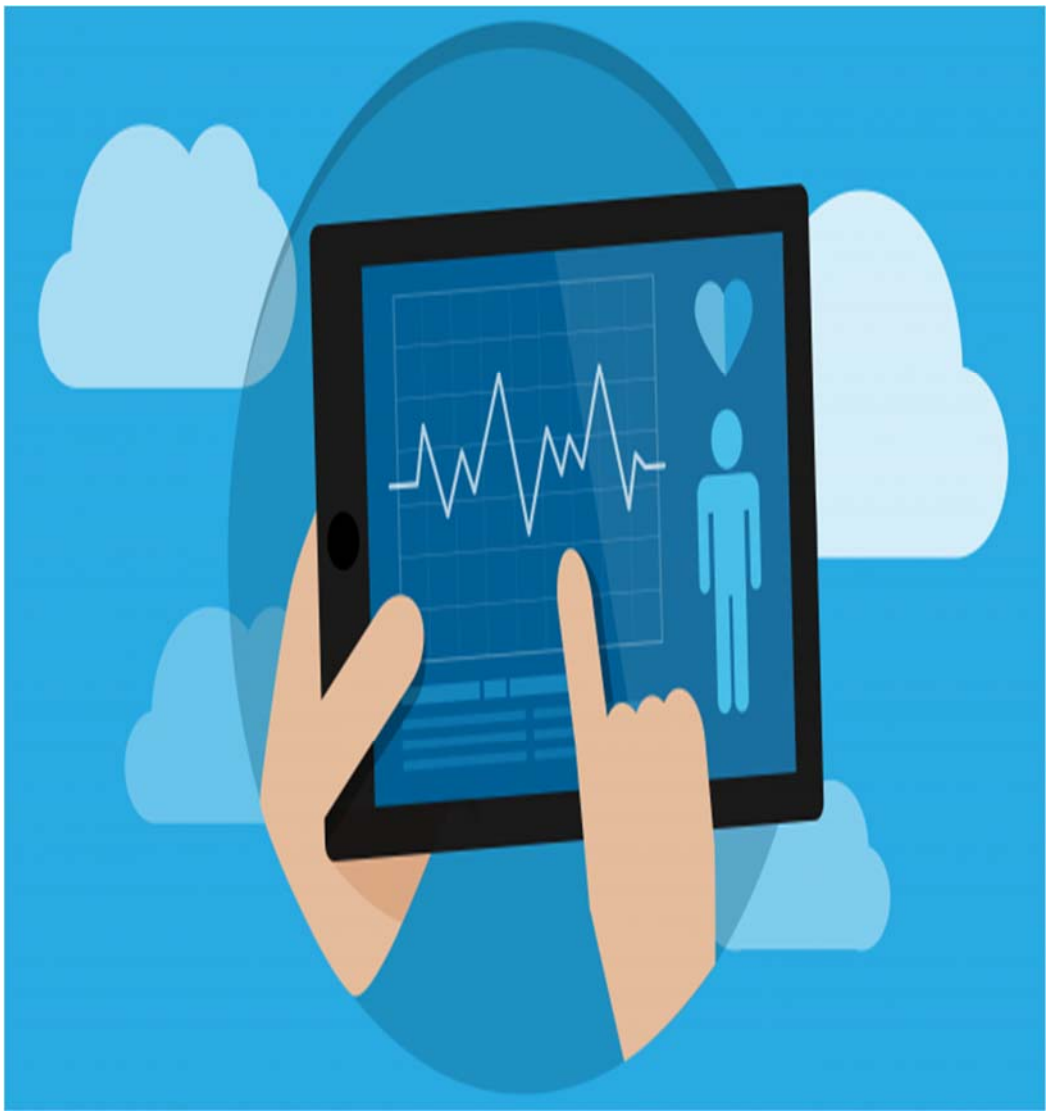
C) **E-Doc in Status [X]:** This indicates that if the assessment has an e-Doc entered in the selected status, the assessment passes the validation.
    i. If this checkbox is selected: The documentation must be in that status selected in order to pass validation.

D) **Scanned Clinical Document:** This indicates that if the assessment has a scanned Clinical Document added, the assessment passes validation.
    i. If *Clinical Documentation Required* is selected, one or both of above fields must be selected.

Appendix J

Participant Recruitment Flyer

Electronic Health Record DNP Project



Participants Needed!

Incentive Provided!

Take part in change!

Are you an RN, licensed to work in New York without restrictions?
Do you have a basic command of technology?
Have you worked on the second floor for over 12 months?
Date of birth between 1992 and 1962?

If you answered YES to all questions, you may qualify to participate in the EHR implementation project. Please go to the 2nd floor nursing station to find out more information!

Appendix K

There were 10 nurse and each completed 2 charts = 20 charts completed in total by 10 participants

Nurse	Pre-implementation (Handwritten) Chart Complete(Yes) Not Complete (No)	Post-implementation (EMR) Chart Complete(Yes) Not Complete (No)
1	Yes	Yes
2	Yes	Yes
3	No	Yes
4	No	Yes
5	No	Yes
6	No	Yes
7	No	Yes
8	Yes	No
9	Yes	Yes
10	Yes	Yes
11	No	Yes
22	No	Yes
33	No	Yes
44	No	Yes
55	No	No
66	No	Yes
77	No	Yes
88	No	Yes
99	No	Yes
00	No	Yes

Appendix L

There were 10 nurse and each completed 2 charts = 20 charts completed in total by 10 participants

Nurse- Chart	Pre-implementation (handwritten) minutes	Post-implementation (EMR) minutes
1	65	39
2	48	37
3	44	41
4	46	54
5	64	38
6	80	43
7	48	34
8	52	40
9	53	40
10	49	40
11	49	55
12	51	48
13	48	36
14	41	45
15	77	37
16	82	46
17	63	37
18	45	37
19	68	49
20	66	53

Appendix M

There were 10 nurse participants

Nurse	Pre-implementation perception of EHR system	Post-implementation perception of EHR system
1	Positive	Positive
2	Positive	Positive
3	Negative	Positive
4	Negative	Positive
5	Negative	Negative
6	Positive	Positive
7	Positive	Negative
8	Positive	Positive
9	Positive	Positive
10	Positive	Positive

Basic APA, 6th ed., Citation Style

APA, 6th ed., Citation Examples Type of Citation	**Beginning of sentence; first mention in text**	**Beginning of sentence; subsequent mention in text**	**End of sentence; first mention in text**	**End of sentence; subsequent mention in text**
One work/ one author	Peters (2015)	Peters (2015)	(Peters, 2015)	(Peters, 2015)
One work/ two authors	Grimm and Page (2014)	Grimm and Page (2014)	(Grimm and Page, 2014)	(Grimm and Page, 2014)
One work/ three authors	Anderson, Smith, and Stewart (2012)	Anderson et al. (2012)	(Anderson, Smith, and Stewart, 2012)	(Anderson et al., 2012)
One work/ four authors	Jones, Stutz, Zay, and Walsh (20**1**6)	Jones et al. (2016)	(Jones, Stutz, Zay, & Walsh, 20**1**6)	(Jones et al., 2016)
One work/ five authors	Anderson, Allen, Sanders, Ramirez, and Kim, (2012)	Anderson et al. (2012)	(Anderson, Allen, Sanders, Ramirez, and Kim, 2012)	(Anderson et al., 2012)
One work/ six authors	Carrion et al. (2015)	Carrion et al. (2015)	(Carrion et al., 2015)	(Carrion et al., 2015)