Doctor of Nursing Practice Project

entitled

The Use of the Re-Engineered Discharge (RED) Toolkit on Patients Undergoing a Hip or Knee Joint Replacement or Revision

by

Kathleen Mitchell

Submitted as partial fulfillment of the requirements for the
Doctor of Nursing Practice Degree

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The University of Toledo
June 2018

An Abstract of

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Discharge planning plays a crucial role in the transition of care. Despite the expenditures dedicated towards discharge planning, organizations struggle with reducing 30-day readmission rates, improving patient satisfaction scores, and length of stay. It is estimated that more than 75% of readmissions are preventable at an estimated cost savings of $12 billion per year. The purpose of this project was to determine among adult patients on an orthopedic unit (P) how does the use of the Re-Engineered Discharge (RED) Toolkit (I) compared to current practice (C) affect staff RED Toolkit compliance rate, discharge time, knowledge for self-management, patient satisfaction with the discharge process, patient readiness for discharge, and 30-day readmission rate? CINAHL Plus, Cochrane Library, PubMed, and Embase were used for literature searches. Nineteen articles were selected, and the level of evidence ranged from I to VII. The synthesis of evidence indicates the RED Toolkit has shown promise in decreasing length of stay, increasing knowledge for self-management, improving patient satisfaction, increasing readiness for discharge, and reducing hospital readmission. The Evidence-Based Practice Improvement Model (EBPI) was used to guide the implementation of the project and took place on an orthopedic unit in a tertiary care hospital in the Midwest. Inclusion criteria included patients 18 years of age and older, who were admitted to an inpatient orthopedic unit for a total hip or knee joint replacement or

revision. Lead nurses and the orthopedic case manager received discharge educator training. The orthopedic case manager also received post discharge follow up phone call training. Process evaluation occurred at daily rounding and weekly meetings with discharge educators to reinforce the use of the RED Toolkit and to address any implementation issues. Outcome measures included staff RED Toolkit compliance rate, discharge time, knowledge for self-management, patient satisfaction with the discharge process, patient readiness for discharge and 30-day readmission rate. Descriptive statistics were used to analyze data. Thirty patients participated in the project. Results indicated that staff achieved a RED Toolkit compliance rate of 86.8%, improved patient knowledge for self-management (85.2-92.6 %), improved patient satisfaction with the discharge process (33% to 59.2%), and improved patient readiness for discharge (2% to 64%). On average the patient was discharged 5.67 (±2.52) hours after the provider wrote the discharge order. 30-day readmission rate was 3.3%. Feedback from the discharge educators indicated a need of streamlined workflow to reduce redundancies, lack of in house support for the orthopedic case manager, and a need to create an electronic after-hospital care plan. Results from the project demonstrated measurable improvement in the key areas of knowledge for self-management, patient satisfaction with the discharge process and patient readiness for discharge. The project represents an opportunity to improve the discharge planning process for other patients on the unit and across the organization.

Acknowledgement

I would like to extend my sincere gratitude to Huey-Shys Chen, PhD, RN, MCHES, FAAN who served as my Doctoral Program Chair. Her invaluable guidance, support and mentoring was instrumental in the completion of this project.

To my other committee members Margaret McFadden, DNP, RN, NE-BC and Yi-Hui Lee, PhD, MBA, RN thank you for providing your feedback and insight during the development of this project.

My special appreciation to the nursing administration including the Chief Nursing Officer and unit director as well as the orthopedic interdisciplinary team, lead nurses and orthopedic case manager who every day work to deliver the best care possible to their patients.

Finally, to my family, thank you for your love, support and understanding throughout the pursuit of this long-sought goal.

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Introduction

Discharge planning is a part of the continuum of care and influences hospital workflow as well as the patient experience (Johnson, Sensei, & Capasso, 2012). The Centers for Medicare and Medicaid Services mandate, as a condition of participation, that hospitals have a discharge planning process for all patients (Center for Medicare Advocacy, 2017). Discharge delays can account for missed revenue, lower scores in patient satisfaction, and transfer bottlenecks (Gray, Santiago, Dimalanta, Maxton, & Aronow, 2016).

The Institute of Medicine (IOM) defines high quality care as "care that is safe, effective, patient-centered, timely, efficient and equitable" (Health Affairs, 2012, p.2). Transition care services are instrumental in assisting the patient to the next level of care and therefore need to be timely. The National Quality Forum (NQF) Safe Practice-15 (2010) expects that organizations benchmark, measure, and continuously improve the discharge process. The IOM report (2001), Crossing the Quality Chasm, described the costs associated with poorly coordinated care transitions, accounting for nearly one-fifth of Medicare readmissions within 30 days' post discharge. It is estimated that more than 75% of these readmissions are preventable at an estimated cost savings of $12 billion per year (Health Affairs, 2012). Under the Affordable Care Act several financial incentives are in place to reward agencies for meeting certain quality measures. These include medical homes, home health practice, community-based care transitions program, and new payment models like the Joint Replacement Model which bundles payment and quality measurement for an episode of care (Health Affairs, 2012).

Description of Problem

Patient satisfaction is an important outcome measure in today's healthcare climate. Patient satisfaction is a component of the total patient experience. The Hospital Consumer

Assessment of Healthcare Providers and Systems (HCAHPS) is a survey completed by patients rating their inpatient stay. HCAHPS results effect medical reimbursement, accounting for one-fourth of the value-based purchasing score (Press Ganey, 2016).

The HCAHPS survey includes 32 questions covering composite, individual, and global topics. Questions on discharge are part of the global domain. A random sample of adult patients are surveyed between 48 hours and six weeks after discharge (Medicare.gov, 2016). The Press Ganey satisfaction survey is more comprehensive than HCAHPS. It includes questions that focus on the quality of services as well as HCAHPS questions that focus on frequency of services (Press-Ganey, 2016).

The Institute for Healthcare Improvement (2017) recommends that healthcare leaders focus on improving the patient experience by providing individualized, coordinated care, and care transitions. Potential benefits from an improved discharge process include decreased wait times in the Emergency Department and inpatient bed placement after surgery; appropriate staffing alignment; improved staff morale; and improvement in patient satisfaction (Johnson et al., 2012). Assisting patients to the next level of care requires a collaborative effort by all members of the health care team. While members of the team may vary, a coordinated discharge process can reduce barriers that impact discharge times, patient flow, satisfaction scores, and readmission rates.

Over half of discharge times, in a tertiary care hospital, exceed the desired internal benchmark of two hours. Discharge time is defined from the time the physician writes the order to the time the patient is discharged from the unit. This affects the placement of patients who are admitted and transferred throughout the day. On average, the Emergency Department holds admitted patients for an average of four hours due to inpatient bottlenecks. The highest volume

of discharges occurs on the orthopedic unit. From 2013-2015, the average discharge time to home from the orthopedic unit was 2:42 pm. The current 30-day readmission rate for hip and knee replacement and revision patients is around 6%. Thirteen orthopedic cases were readmitted in the first two quarters of 2017. One orthopedic surgeon expressed interest in developing processes and systems to support a decrease in postoperative readmission for total hip and knee replacement and revision patients. Press Ganey and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores, specific to the topic of discharge, are below the top box score in patients surveyed from the orthopedic unit. Overall patient satisfaction for this population from January 2017 to August 2017 was 33%. The extent that patients felt ready for discharge was consistently around 2%. A review of the organization finds no defined discharge planning process or ownership for the procedure on the orthopedic unit. One feasible solution for improving the transition of care is to establish and implement a coordinated discharge procedure.

The role of a discharge planning coordinator is to assess the needs of the patients, coordinate resources, and develop a discharge plan (An, 2014; Jack et al., 2009). Current practice does not assign these responsibilities to one individual. While each member of the health care team has a role to play in discharge planning, discharge planning is most effective when accomplished in an interdisciplinary fashion (Gray et al., 2016; Jack et al., 2009, McCann-Spry et al., 2016; Pottenger et al., 2016, & Wertheimer et al., 2014).

Purpose and Goals

The purpose of the proposed evidence-based practice improvement project was to determine if on an orthopedic unit, in an acute care setting the use of the RED Toolkit, compared to not using the RED Toolkit, affected staff RED Toolkit compliance rate, discharge time,

knowledge for self-management, patient satisfaction with the discharge process, patient readiness for discharge, and 30-day readmission rate. The goal of the project was to utilize the RED Toolkit as the standard of care for all patients to improve the discharge process.

PICOT Question

A clinical question utilizing the PICOT format was developed to assist in evaluating a possible solution to the clinical problem. The PICOT format identifies components of the clinical question. **P** refers to the population of interest in the study; **I** refers to the intervention that will be instituted; **C** stands for the comparison between the usual care group and the experimental group; **O** refers to the outcomes being measured; and **T** refers to the time for data collection (Fineout-Overholt & Stillwell, 2015). The PICOT question is a strategy used by clinicians to find the best evidence. The following PICOT question was proposed: Among adult patients on an orthopedic unit (P) how does the use of RED Toolkit (I) compared to current practice (C) affect staff RED Toolkit compliance rate, discharge time, knowledge for self-management, patient satisfaction with the discharge process, patient readiness for discharge, and 30-day readmission rate?

Guiding Frameworks

The Evidence-Based Practice Improvement (EBPI) model was used as the guiding framework for the project. The EBPI model integrates evidence-based practice and performance improvement into one model (Levin et al., 2010). The first step is to describe the practice problem. Levin et al. (2010) point out the importance of understanding the problem in a larger context. This can be done by examining internal organizational data and literature relevant to the

problem. A focused clinical question is then formulated using the PICO format. The third step of the model is to search for the highest quality of evidence to answer the practice question. The levels and quality of evidence need to be determined in this step. After the search for evidence, the literature is critically reviewed and summarized. In the fifth step, an aim statement is developed. The aim statement includes the desired outcome, goal statement, and performance in measured terms. After the development of an aim statement, the team conducts small tests of change using the Plan-Do-Study-Act (PDSA) cycle. In a pilot, processes can be refined, desired outcomes addressed, and evaluated prior to implementation across the system (Levin et al., 2010). The last step of the model is the dissemination of best practice on a wider scale. During this time data is collected and evaluated against established benchmarks. The dissemination of best practice moves across the system once movement toward better outcomes is noted (Levin et al., 2010). Rationale for selection of the model includes its' clarity, simplicity, and step by step approach. The model helps to prevent the dissemination of practice changes and unnecessary use of resources prior to testing and refining process issues (Levin et al., 2010). The model is a fit for the proposed project due to its integration of EBP and quality improvement, alignment with project goals, and ability to allow for the practice change to be "tested' as a pilot with outcomes and lessons learned used for system-wide spread.

John Kotter's (1996) eight step model for change was also used as a supporting framework for project implementation. The first step, establishing a sense of urgency, calls upon the leader to make a case for change rather than maintaining the status quo. In the spring of 2017, the Chief Nursing Officer instituted a call to action to improve the discharge planning process. Reasons to re-engineer the discharge process including internal data on discharge times,

patient satisfaction rates, patient readiness for discharge and readmission rates for hip and knee joint replacement and revision cases were shared with key stakeholders at a project kick-off meeting. In the next step, creating a coalition, key participants are engaged with the drive and resilience to advance the change. The orthopedic unit interdisciplinary discharge planning team consisting of lead nurses, orthopedic case manager, physical therapist, occupational therapist, social worker, resource utilization coordinator, as well as chief nursing office and unit director collaborated to implement the change. The third step, develop a vision and strategy, requires the facilitator to provide direction, timelines, and resources to move the team to action. The project lead met with the team to introduce the RED Toolkit, address purpose and goals of the project, implementation timeline, education plan, RED components, After Hospital Care Plan (AHCP), process and outcome documentation. Staff education was completed, and training materials were provided to those assuming the role of discharge educators. Communicate the vision of change is the fourth step of the process. Here the leader must deliver a consistent message both in word and action. Daily visits to the orthopedic interdisciplinary discharge planning meetings to provide encouragement, answer questions and address staff concerns was provided by the facilitator. Kotter's fifth step requires the leader to empower for broad-based action. In this step, individuals are encouraged to be creative and think “outside to box” to problem solve and address impediments to change. Due to concerns about time and role overlap, the lead nurses and orthopedic case manager determined that the lead nurse would complete the after-hospital care plan and the orthopedic case manager would complete the follow up phone call. The orthopedic manager also elected not to complete the follow up phone call if the patient was seen in clinic within two-three days after discharge. In the next step, plan for and create short-term wins, there is recognition of gains and successes. Positive reinforcement of completion of after

hospital care plans and follow up phone calls was given to staff. In the seventh step, consolidating gains and producing more change, new targets are created, and other individuals are added to the team. This adds energy and persistence to continue the momentum of change. Nurses who assumed charge responsibility on the weekend took pride in providing patients with the after-hospital care plan. In Kotter's last step, institutionalize the change, the new models of behavior are integrated into the culture. The process and final evaluation will be presented to nursing leadership to determine the future use of the RED Toolkit.

Review of Literature

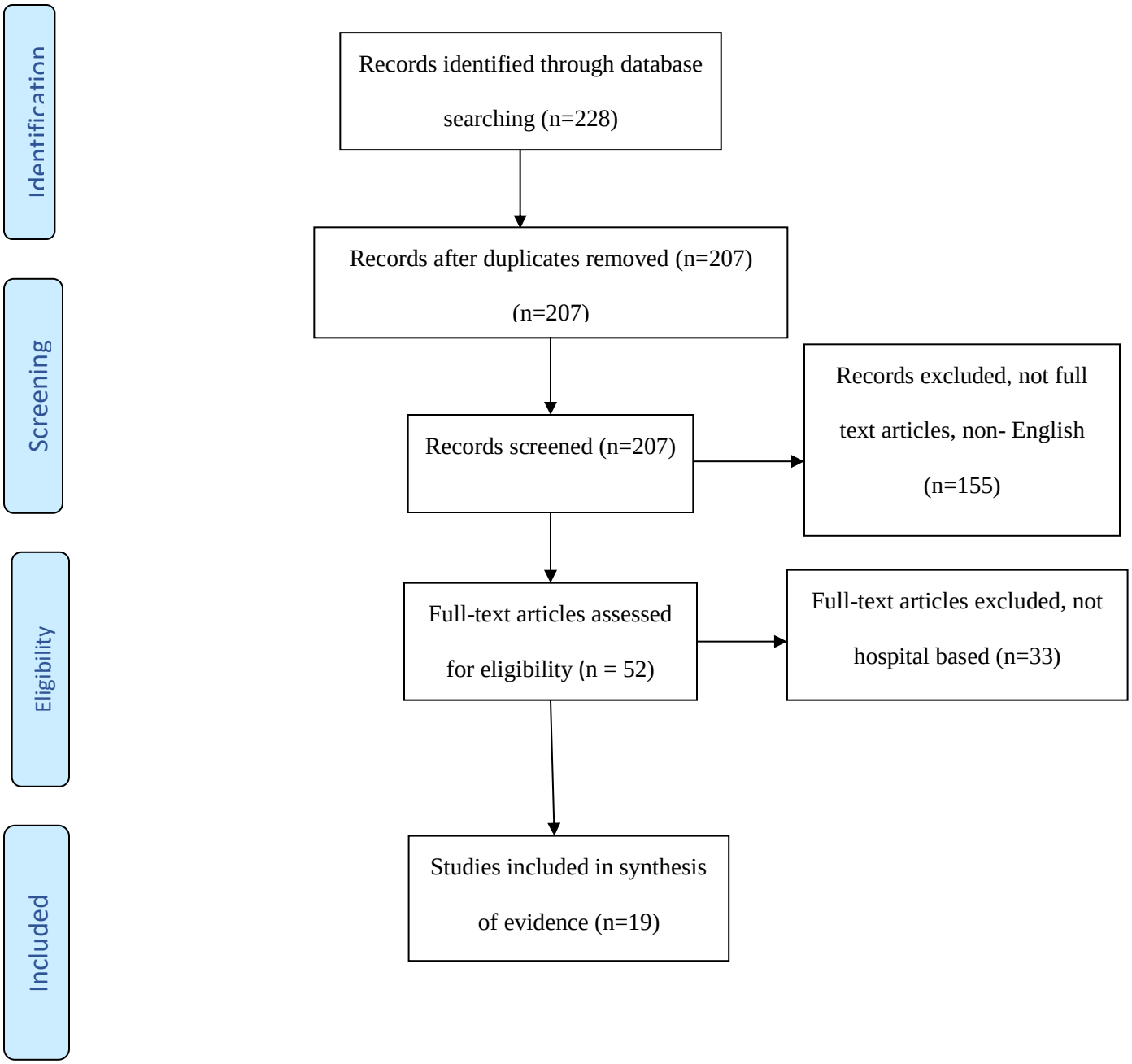
Search Strategies

Four electronic databases containing nursing and healthcare literature were searched: CINAHL Plus, Cochrane Library, PubMed, and Embase. Key words “discharge,” “orthopedic,” “coordinator,” “hospital discharge,” “nursing,” “nurse,” “length of stay,” “discharge planner,” “patient satisfaction,” “discharge coordinator,” “discharge planning,” and “nursing staff” were combined with the Boolean connector AND. No date limit was placed on the search. The search was limited to English publications. Of the 2,000 article citations, 52 abstracts were reviewed, and 11 were found to contain evidence related to the clinical question. The author performed hand searches from reference lists which yielded eight additional reports. Additional information was obtained regarding discharge planning, safety and quality, and care transition statistics.

As a result of the original search and further examination of the literature, a second search was deemed necessary to learn more about the Re-Engineered Discharge (RED) Toolkit. The search engines Google Scholar, CINAHL, PubMed, and Embase were utilized to search for

scholarly literature on the use of the Re-Engineered (RED) Toolkit through July 2017. Key words “re-engineered discharge,” “reengineered discharge,” “red toolkit,” and “project red” were used with the Boolean connector OR. No date limit was placed on the search. Only English publications were included. The search yielded 228 articles. Of these, 33 articles were reviewed, and 8 articles were found to be relevant to the topic. The search strategies and evidence selection process for the second search are summarized in Figure 1.

Figure 1
Search Strategies and Evidence Selection Process



Appraisal Methods

The PICOT question guided the selection of articles during the initial literature search. Studies for the proposal included adult patients, an inpatient unit setting, the use of a case manager, discharge planner, or discharge coordinator. Excluded studies were those that occurred in a long-term care environment or pediatric setting, and non-English articles.

A total of 17 articles were found to contain considerable evidence related to the clinical question. Of these, 11 articles were selected for critical appraisal and evaluation. In the second search, a total of 34 articles were found that mentioned the RED Toolkit's use in health care facilities. Of these, eight articles were chosen for critical appraisal and evaluation based on institutional use of the RED Toolkit. Strength of evidence and evaluation of each article, in relation to the clinical question, occurred utilizing Melnyk and Fineout-Overholt's (2015) rating scheme. Evidence from a systemic review or meta-analysis of all relevant randomized control trials (RCT's) is considered Level I evidence. Level II evidence is obtained from well-designed RCT's. Level III evidence is from well-designed controlled trials without randomization. Evidence from well-designed case-control and cohort studies is considered Level IV evidence. Level V evidence comes from systemic review of descriptive and qualitative studies. Level VI evidence is from single descriptive or qualitative studies. Level VII, the lowest level of evidence, is from the opinion of authorities and/or reports of expert committees.

Evaluation of Evidence

Categories of the articles in the initial search yielded two systematic reviews, one randomized control trial (RCT), two well-designed controlled trials without randomization, four descriptive studies, and two studies from the opinion of authorities. Articles from the second search were categorized into one systematic review, four descriptive or qualitative studies, and

three expert opinions. The review of each article included conceptual framework, design/method, sample/setting, major variables studied and their definitions, measurement, data analysis, findings, and appraisal for worth to practice and are found in Table 1.

Table 1

Evaluation of Evidence

Citation	Conceptual Framework	Design/ Method	Sample/Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
An, D. (2014). Cochrane Review Brief: Discharge planning from hospital to home. The Online Journal of Issues in Nursing, 20(2).	None **Purpose**: effect of discharge planning advocate on length of stay, readmission rate to hospital, patient health status, patient satisfaction and cost to the hospital.	Systematic review (Cochrane review) Level: 1	**Sample**: N = 8,098 participants. **Setting**: Hospitalized patients regardless of age, gender or health status.	**IV** = nurse discharge planning advocate **DV1**= length of stay **DV2**= patient satisfaction	**Length of stay in hospital**: not defined **Patient satisfaction**: not defined	Confidence Intervals; Relative Risk;	↓ LOS: mean difference -0.91, 95% CI [-1.55 to -0.27] Patient satisfaction: ↑ (P<0.05)	**Weakness**: Didn't include full body of evidence. Detailed description of search strategy and key terms is missing; description of how validity of individual studies was measured is lacking; no measurement tool for patient satisfaction No cost data **Strengths**: Sample size **Conclusion and feasibility**: Support for nurse as discharge planner but difficult to determine feasibility without more detail.

DV = dependent variable; IV = independent variable

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Goncalves-Bradley, D. C., Lannin, N. A., Clemson, L. M., Cameron, I. D., & Shepperd, S. (2016). Discharge planning from hospital (Review). Cochrane Database of Systematic Reviews, Issue 1. Doi: 10.1002/146518558	None Purpose: effect of discharge planning from the hospital; Searched 5 databases (1946-2015). Included only studies with a control group.	Systematic Review (Cochrane Review) Level: I	N= 30 studies (11,964 participants) Setting: 21 trials included older persons with a medical condition; 5 trials included a mix of medical and surgical patients; 1 study included persons from a psychiatric hospital; 1 trial from both a psychiatric and general hospital; 2 trials from patients admitted to the hospital following a fall Attrition: NR	**IV =** personalized discharge plan **DV 1=** length of stay **DV 2 =** patient satisfaction	**Personalized discharge plan**: (Marks, 1994); no validity or reliability reported **Length of stay**: Follow up 3-6 months **Patient satisfaction**: Satisfaction measures not consistent across studies	Confidence Interval	 Length of stay for patients admitted to hospital with a medical condition and individualized discharge plan MD – 0.73, 95% CI – 1.33 to -0.12; Discharge planning may  lead to Satisfaction for patients and healthcare staff	**Weakness:** Definition of the intervention **Strengths:** Sample size **Conclusion & feasibility:** Support for individualized discharge plan to decrease length of stay and improve patient satisfaction but does not specifically address role of nurse; 12 Trials of moderate certainty evidence for length of stay; 6 Trials of low certainty evidence for patient satisfaction

DV = dependent variable; IV = independent variable; MD = mean difference; NR = not reported

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Jack, B.W., Chetty, V.K., Anthony, D., Greenwald, J.L., Sanchez, G.M., Johnson, A.E.,Culpepper, L.et al (2009). A reengineered hospital discharge program to decrease re-hospitalization. Annals of Internal Medicine, 150, 178-187.	None **Purpose**: to determine the effects of a hospital discharge program on emergency department visits and hospitalization within 30 days of discharge Secondary outcomes: self-reported preparedness for discharge; rate of primary care provider (PCP) follow up visits; knowledge of discharge diagnosis	RCT Level: II	**Sample**: N=749 English speaking hospitalized adults; 18 years or older with a home discharge plan (mean age, 49.9 years) Block randomization used Intervention group (n=370) Control group (n=368) Attrition: n =11 Previous enrollment = 1 Death = 3 Request to be removed = 7 **Setting:** Metropolitan, academic hospital - general medical service	**IV**: nurse discharge advocate (DA); after hospital care plan (AHCP); follow up phone call by pharmacist 2-4 days after discharge (bundled intervention) DA= facilitates discharge plan by working with the team; provides patient education **DV**: self-reported preparedness for discharge	**Self-reported preparedness for discharge**: Questionnaire: 5-point Likert scale.	Descriptive statistics	Increased patient self-perception of preparation for discharge: identify primary diagnosis, reported better understanding of diagnosis, medications and appointments Control group: n (%)* 163 (55) Intervention group: n (%)* 197 (65) P value= 0.013 *reflects the percentage of individuals who responded, “very prepared” or “prepared” (the top 2 categories of the scale).	**Weaknesses**: Study occurred at one hospital; all potentially eligible participants were not enrolled; self-report utilized for some of the outcome measures. Sample was younger with few co-morbidities; limits ability to generalize; Intervention was bundled so not able to determine the effect of each intervention on the results. DA was part time. **Strengths**: The sample size was large enough to demonstrate an effect. **Conclusion & Feasibility:** Program reduced hospital utilization, improved patients self-perceived preparation for discharge and increased PCP follow up; may be reasonable to implement.

DV = dependent variable; IV = independent variable

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Haddock, K.S. (1994). Collaborative discharge planning: Nursing and social services. Clinical Nurse Specialist, 8(5), 248-252.	Continuity of Care McKeehan and Coulton (1985) Purpose: determine the effects of a structured discharge planning program between a clinical nurse specialist (CNS) and a social worker	Quasi-experimental Level: III	Sample: N=64 elderly patients; n=29 in the experimental group (65 years or older, minimum 3-day hospitalization; admitted from a non-institutional setting to a medical-surgical unit, able to be reached by phone after discharge and at least one functional deficit) Setting: an acute care hospital in southeastern U.S.	**IV1:** discharge planning by a CNS and social worker through a structured protocol and using the Long-Term Care Information System (LTICS) to guide assessment, planning and implementation of discharge planning. **IV2**: Telephone call 2 weeks and 30 days after discharge **DV1**: Length of stay **DV2**: satisfaction with discharge planning	Chart audit was completed 30 days after discharge to determine length of stay. Patient satisfaction was measured by 10 questions developed by the research. Likert scale response ranging from 1 (very satisfied) to 4 (very dissatisfied). Cronbach's alpha of 0.9	Frequencies, and t-tests.	Adjusted length of stay, although not significant, showed that the experimental group had an adjusted length of stay of 2.69 (SD = 11.7) days more than the DRG average length of stay, while the control group had 2.8 (SD = 8.33) days above the average length of stay. Patients in the experimental group were significantly more satisfied (mean ± SD, 1.24 ± 0.23) than patients in the control group (2.14 ± 0.52). P= .0.001	**Weaknesses:** Cost not measured **Strengths:** Demonstrates advantages of collaboration **Conclusions and feasibility:** Findings support structured discharge planning between the CNS and social worker. Patients who are involved in the discharge plan have a higher level of satisfaction

DV = dependent variable; IV = independent variable

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Hadjistavropoulos, H.D., Garratt, S., Janzen, J.A., Bourgault-Fagnou, M.D., & Spice, K. (2009). Development and evaluation of a continuity of care checklist for improving orthopaedic patient discharge from hospital. Journal of Orthopaedic Nursing, 13, 183-193. doi: 10.1016/j.joon.2009.05.006	Conceptualization of Continuity of care (Haggerty et al. 2003) Purpose: To evaluate a Continuity of Care Checklist for patients discharged to community from an orthopaedic unit	Pre/post design Level: III	Sample: N=154 (77 in treatment as usual group; 77 in the CCC group and interviewed to examine changes in care). Sample: N= 12 nurses surveyed on use of CCC Setting: patients discharged from an orthopaedic unit in Canada	**IV1:** Continuity of Care Checklist (CCC) Essential tasks required to be completed before discharge; **IV2:** Patient brochure **DV1:** Satisfaction with patient-provider relationships **DV2**: Nursing satisfaction with CCC	Patient Continuity of Care Questionnaire (PCCQ, Hadjistavropoulos et al, 2008) Nursing satisfaction was measured in a 20-60 minutes open-ended audiotape interview	**Patient Satisfaction**: Chi-square for categorical data and t-tests for continuous measures **Nursing satisfaction**: Qualitative analysis	CCC participants were more satisfied with information they were provided and with relationships with providers compared to treatment as usual group Nurses Positive comments: CCC improved standards for ensuring continuity of care and improved patient knowledge; negative comments time to complete CCC and implementation issues	**Weaknesses:** Small sample size **Strengths:** Input from many regions in Canada who had clinical or research interest in continuity of care. **Conclusions and feasibility**: Support for use of CCC to assist nurses in identifying and documentation care needs and improvement of patient care in informational, relational and management continuity.

DV = dependent variable; IV = independent variable

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Bull, M.J., Hanse, H.E., & Gross, C.R. (2000). Predictors of elder and family caregiver satisfaction with discharge planning. Journal of Cardiovascular Nursing, 14(3), 76-87,	Professional Patient Partnership Model of Discharge planning (Bull, et al., 2000) Purpose: to determine if there is a difference between elder and family member satisfaction with discharge planning 2 weeks after hospitalization and what factors predict satisfaction with discharge planning 2 weeks after hospitalization of elders hospitalized with heart failure and their family caregivers.	Longitudinal design Level: VI	Sample: 134 elders at least 55 years of age who had been hospitalized with heart failure, spoke and understood English and had an adult who would help after discharge Setting: 2 large community hospitals (400-500 beds) in the Midwest	IV: discharge planning DV1: Patient satisfaction DV2: caregiver satisfaction	Discharge planning process not well defined Modified Client Satisfaction Questionnaire (CSQ) (Cronbach's alpha coefficient .84-.93) Continuity of care was measured using a 12-item questionnaire	Descriptive statistics: Paired t-test, Pearson's correlation coefficient, unpaired t- test	No statistically significant differences in discharge planning satisfaction of elders and their family caregivers. Continuity of care and extent to which patients and caregivers felt prepared to manage care after discharge were the best predictors of elder and family caregiver satisfaction with discharge planning	**Weaknesses**: Data was limited to 2 weeks after hospitalization; single item measures were not able to isolate various aspects of care; no clear definition of discharge planning **Strengths**: Length of study **Conclusions and feasibility:** Difficult to implement due to lack of defined discharge planning process, nurses can impact continuity of care and preparation for discharge

DV = dependent variable; IV = independent variable

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Gray, E.A., Santiago, L., Dimalanta, M.I., Maxton, J., & Aronow, H.U. (2016). Discharge by 11:00 a.m.: The significance of discharge. Medical Surgical Nursing, 25(6), 381-384.	None Purpose: To improve patient satisfaction scores and increase hospital safety	Descriptive study Searched 3 databases (2009-2015) Level: VI	Sample: N not reported Setting: 28 bed medical surgical unit in a 958-bed academic teaching hospital	**IV**: Interdisciplinary approach to discharge planning **DV1**: Discharge before 11 am **DV2**: Patient satisfaction	**Interdisciplinary approach**: unit manager, case manager, social worker, charge nurse, pharmacist & clinical nurse **Discharge before 11 am**: unit based total discharges per month **Patient Satisfaction**: unit based HCAHPS reports	Descriptive data; Mann-Whitney U and t-test, and correlations	Unit discharges by 11 am increased (z=1.99, p=0.046) Percentage of patients discharge each month on time improved (t-test= -2.706, df=34, p=0.011) Patient satisfaction + correlation with discharge by 11 am (r=0.347, p=0.038)	**Weaknesses**: Does not address how diagnosis, admitting physician or other barriers can affect discharge time; single unit study **Strengths**: Study length: 37 months **Conclusion & feasibility:** Goal of discharge by 11 am achieved by coordination among disciplines and streamlining the discharge process; role of clinical nurse in the discharge process for each shift was clarified as well as charge nurse; has feasibility in other inpatient units

DV = dependent variable; IV = independent variable

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Pottenger, B.C., Davis, R.O., Miller, J., Alien, L., Sawyer, M. & Pronovost, P.J. (2016). Comprehensive unit-based safety program (CUSP) to improve patient experience: How a hospital enhanced care transitions and discharge processes. Quality Management in Health Care, 25(4), 197-202.	High-reliability organizing (Weick & Sutcliffe, 2007).	Time-series study design Level: VI	Setting: 318 bed community hospital	**IV1**: CUSP Ready to go cards; medication instruction, increased communication on process delays, telephone calls after discharge **DV1**: Improved care transition **DV2**: Improved Discharge process	**HCAHPS Discharge Information**: Percentage of patients choosing the top (best) response (always, yes or strongly agree, or 9 or 10 on a 10-point scale) for each item. **HCAHPS Care Transitions**: Percentage of patients choosing the top (best) response (always, yes or strongly agree, or 9 or 10 on a 10-point scale) for each item. **HCAHPS Hospital Ratings:** Percentage of patients choosing the top (best) response (always, yes or strongly agree, or 9 or 10 on a 10-point scale) for each item.	Comparison of percent top scores from pre- to postintervention	Top scores for the discharge information domain and related items increased 3.4 percentage points. Top scores for the care transitions domain and related items increased from 3.0 percentage points. The percentage rating the hospital a top score of 9 or 10 increased 7.0 percentage points; percentage responding "definitely yes" to recommending hospital to family and friends increased 9.3 percentage points	**Weaknesses**: tested in one community hospital; improvement was followed for a brief period; difficult to ascertain sustainability; no information on costs; due to study design, inferences can't be made linking initiative to improvement in HCAHPS scores although no other system initiative occurred during this time **Strengths:** Includes ideas on use of front line staff in problem solving process **Conclusions & feasibility**: Findings may not be generalizable; Some support, not reliable enough.

CUSP = Comprehensive Unit-based Safety Program; DV = dependent variable; HCAHPS; Hospital Consumer Assessment of Healthcare Providers and Systems Survey; IV = independent variable

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Wertheimer, B., Jacobs, R. E., Bailey, M., Holstein, S., Chatfield, S., Ohta, B., Horrocks, A., & Hochman, K. (2014). Discharge before noon: An achievable hospital goal. Journal of Hospital Medicine, 9(4), 210-214.	None Purpose: to achieve a DBN rate of 30% and to evaluate the effect of the intervention on O/E LOS and 30-day readmission rates	Pre-/post-intervention retrospective analysis Level: VI	Sample: All patients discharged from two inpatient units. N = 2536 in the pre-intervention period; N = 3277 In the intervention period Setting: Two acute care inpatient medical units in an urban, academic medical center Sample excluded the time the floor was closed due to a natural disaster; other exclusions include observation status, death and inpatient hospice	**IV1:** DBN checklist of daily responsibilities; **IV2**: afternoon interdisciplinary rounds; **IV3**: DBN website; **IV4**: feedback on DBN percentage; **IV5** rewards for success; **IV6**: case review **DV**: Discharge before noon	**Observed to expected length of stay** = Expected LOS in days divided by the observed (actual) LOS in days. **DBN**: Discharge before 12:01 PM; **DBN percentage based on calendar month** = number of DBN patients divided by the total number of discharged patients during the calendar month.	2- tailed z test; Wilcoxon rank sum test	DBN increased from 11% to 38% over the 13-month intervention period (P = 0.0002) Average discharge time moved 1 hour and 31 minutes earlier in the day. The observed-to-expected length of stay declined from 1.06 to 0.96 (P = 0.0001)	**Weaknesses**: Study is limited due to multiple interventions; unable to isolate effect of individual changes. **Strengths**: sample size **Conclusions and feasibility**: Discharge before noon is feasible and generalizable to like medical centers.

DBN = discharge before noon; DV = dependent variable; IV = independent variable; LOS = length of stay; O/E = observed-to-expected

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
McCann-Spry, L., Pelton, J., Grandy, G., & Newell, D. (2016). An interdisciplinary approach to reducing length of stay in joint replacement patients. Orthopaedic Nursing, 35(5), 279-298.	None Purpose: To reduce length of stay in hip and knee joint replacement patients	Quality improvement project Level: VII	Sample: Not stated Setting: 5 orthopedic units in a regional healthcare system	**IV1**: Provider Communication (Letter to orthopedic providers, mid -level provider, orthopedic residents internal medicine residents, and various staff) **IV2**: Patient Communication (modification of patient education class; use of white board in patient rooms to communicate discharge goal of day 2; unified scripting) **IV3**: Risk Assessment and Prediction (Risk Assessment and Prediction Tool RAPT done in pre-op class **IV4**: Physical therapy on post-operative day 0 (day of surgery)- patients to receive at least one session of therapy on the day of surgery **DV1**: LOS	Run charts	Descriptive data	LOS was reduced on average by 0.5 days per patient for primary hip and knee joint replacement surgeries and cost savings of approximately $400 per patient	**Weaknesses**: Sample size uncertain **Strengths:** No negative outcome reported on quality and patient satisfaction. **Conclusions and feasibility:** Length of stay and costs reduced; program expanded to spinal fusion population due to its success; RAPT valuable in helping identify patient disposition and assist in developing discharge plan after surgery

DV = dependent variable; IV = independent variable

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Hayward, M., Endo, J., & Ruthford, P. (2014). Institute for Healthcare Improvement: A focus on 'Always Events.' Healthcare Executive, 29(1), 78-81.	Always Events Framework (IHI,2014) Purpose: to evaluate the use of the Symptoms, Medications, Appointments, Results and Talk with Me, (SMART)discharge protocol on 31-day readmission rate, 31-day post hospital ED visit rate, patient satisfaction related to discharge and % of patients who were aware of receiving SMART discharge education	Protocol Level: VI	Sample: N – not stated; Setting: 3 inpatient units win a community hospital in Maryland	**IV:** SMART discharge protocol **DV:** Patient satisfaction	Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores	Not reported	Improvements seen in patient satisfaction	**Weaknesses**: full body of evidence not available **Strengths**: Structured discharge protocol helps to ensure that patients receive information to 5 key areas **Conclusions and feasibility**: SMART protocol has potential to improve HCAHPS scores

DV = dependent variable; IV = independent variable

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Alper, E., O'Malley, T. A., Greenwald, J., Aronson, M. D., & Park, L. (2014). Hospital discharge and readmission. Retrieved from www.uptodate.com/contents/topic.do?topicKey=PC/2790	None **Purpose:** Overview of the discharge process, determination of next site of care, review of interventions to reduce likelihood of unplanned readmissions	Systematic Review 110 studies (1998-2017) Level: I	**Setting 2:** large single-center **Sample 2**: not reported **Sample 3:** systematic review of 34 studies; 1000 general medicine patients **Setting 3:** 12 U.S. academic medical centers	**IV 1:** discharge (DC) planning: patient's individualized plan for post discharge services prior to leaving the hospital **DV1**: patient satisfaction, length of stay, readmission rate, mortality rate **IV2**: completed discharge summary **DV3:** unavoidable readmissions	**IV1:** not reported **DV1:** not reported **IV2:** completed within 3 days of discharge **DV3**: Avoidable was defined as those with a greater than 50% chance that the readmission could have been avoided	Not stated categorical Descriptive statistics sample 3	**Sample 1:** Limited impact of discharge planning  on outcomes; patient satisfaction;  length of stay and readmission  rates; mortality rates **Sample 2:** higher rates of readmission were related to a 3-day delay in completion of DC summary **Sample 3:** Median proportion of preventable readmissions was 27% but ranged from 5 to 79%; factors strongly associated with preventable readmission: ED decision-making regarding readmission (adjusted OR 9.13, 95% Cl 5.23-15.95); failure to relay important data to outpatient providers (adjusted OR 4.19 95% Cl 2.17-8.09), discharge patients too soon (adjusted OR 3.88, 95% Cl 2.44-6.17) and lack of	**Weaknesses:** variables, measurement and data analysis not included (sample 1) due to heterogeneity of interventions, patient populations and outcomes, not able to identify which specific interventions had a direct impact on measured outcomes (sample 5) **Strengths:** sample size **Conclusion and feasibility:** 50% of potentially preventable readmission was felt to be linked to interventions that could have been provided during the initial hospitalization; patients seen for follow up are less likely to be readmitted; multifaceted interventions prevented early readmissions

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
			Sample 4: Medicare heart failure patients **Setting 4:** 225 hospitals **Sample 5:** 43 studies; 16 randomized trials **Setting 5:** not reported	**IV4**: physician follow up **DV4**: readmissions **IV 5**: multifaceted interventions **DV5**: readmission rate	**IV4**: within seven days of discharge **DV4:** within 30 days **IV5:** simultaneous interventions including patient centered discharge instructions and a post-discharge phone call **DV5**: within 30 days		discussion of goals with patients with serious illness (adjusted OR 3.84, 95% Cl 1.39-10.64). **Sample 4:** Readmission rates were highest for patients discharge with the lowest percentage of patients seen for follow-up within seven days of discharge **Sample 5**: 5 of 16 randomized control trials demonstrated significant decreases in readmission rates	

IV = Independent variable; DV = Dependent variable

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Adams, C. J., Stephens, K., Whiteman, K., Kersteen, H., & Katruska, J. (2014). Implementation of the Re-Engineered Discharge (RED) Toolkit to decrease all-cause readmission rates at a rural community hospital. Quality Management in Healthcare, 23(3), 169-177.	None **Purpose**: To use the Re-engineered Toolkit (RED) to redesign the discharge process to reduce 30-day all-cause readmission rates and improve patient/family involvement in the discharge process	QI Project Level: VI	**Sample**: N= 336 patients **Setting**: 30-bed medical - surgical unit in a rural community hospital in southwest, Pennsylvania	**RED Toolkit** **IV1:** Patient communication folder (PCF) **IV2**: After Hospital Care Plan (AHCP) booklet **DV1:** monthly 30-day all cause readmission rate **DV2:** patient and family involvement in early assessment for post-discharge planning	**DV1:** Readmission: hospitalization within 30 days of discharge from an acute care admission determined using JCR-HEN predetermined calculation **DV2**: discharge & readmission questionnaire	MiniTab, version 15	↓ in readmission rates by 32%; Patient and family perception of discharge process positive	**Weakness:** Patient and family involvement data not unit specific **Strength:** Sample size, some cost data **Conclusion & feasibility:** RED Toolkit and ACHP were helpful in reducing all-cause readmission rates; but did not significantly improve patient and family involvement in discharge planning although perception improved.

IV = Independent variable; DV = Dependent variable

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Markley, J., Andow, V., Sabharwal, K., Wang, Z., Fennell, E., & Dusek, R. (2013). A project to reengineer discharges reduces 30-day readmission rates. American Journal of Nursing, 113(7), 55-64.	None **Purpose**: to reduce 30-day all-cause hospital readmission by 2%	Quality Improvement project Level: VI	**Sample:** initially heart failure patients on a telemetry unit and then expanded across the hospital **Setting:** 5 volunteer community hospitals in southern Texas	**IV1:** Project RED (Re-Engineered) Toolkit 1) in hospital patient education 2) comprehensive discharge planning 3) post discharge patient follow-up **DV1**: impression of care **DV2:** 30-day all cause hospital readmission	**IV1:** numbers 1, 2, 3, 4, 5 and 11 **DV1:** patient survey **DV2:** monthly 30-day readmission rates for heart failure patients and the entire facility	Descriptive statistics	30-day readmission rate reduced by 8.3% from 23.3% to 15% (P=0.002) for all Medicare fee for service across the facility; Readmission rates in post-acute care community providers decreased from 19% to 12% (P=0.06)	**Weaknesses:** Provider specific data not able to be reported when fewer than 11 patients are readmitted **Strengths:** elements of success include strong project leadership; spreading interventions throughout the hospital; engaging with post-acute care providers in the community; conduct concurrent monitoring of RED Interventions **Conclusion & feasibility:** improved communication and coordination can improve readmission rates;

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Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Mitchell, S. E., Martin, J., Holmes, S., van Deusen Lukas, C., Cancino, R., Paasche-Orlow, M…Jack, B. (2016). How hospitals reengineer their discharge processes to reduce readmissions. Journal for Healthcare Quality, 38(2), 116-126. doi: 10.1097/JHQ.0000000000000005	Organizational transformational model (Lukas et al., 2007) **Purpose:** To study the RED (Re-Engineered Discharge) implementation process	Qualitative and descriptive study Level: VI	**Sample:** Purposive sample of 10 hospitals **Setting:** community, for-profit, academic and non-academic institutions in different regions across the United States	**IV:** Reengineering discharge (RED) Toolkit (policy-level information; toolkit module training; installation of software and technical assistance) **DV1:** Readmission outcomes **DV2**: Implementation experience	**IV**: all 11 items of RED were implemented or adapted **DV1:** publicly reported hospital pre-implementation and post-implementation readmission rates (Hospital Compare) were compared **DV2:** Recurrent themes	Delphi consensus method to prepare RED Toolkit; Interview data analyzed with constant comparative method	8/10 hospitals reported improvement in the 30-day readmission rate Four recurring themes: 1) variations in fidelity to RED implementation; 2) factors associated with successful implementation; 3) challenges to implementation; 4) impact of RED implementation; 7 hospitals implemented RED as planned with reduction in 30-day readmission rate for at least one of 3 diagnostic areas (congestive heart failure, acute myocardial infarction, and pneumonia) after implementing RED. Successful organizations reported improved hospital culture	**Strength:** 1st study to examine implementation experiences of hospitals after implementing a transitional care program **Weakness**: social desirability response bias; emergency department visits were not included in the hospital utilization outcome assessment; impact of financial resources or community factors on readmission rates; observation period insufficient **Conclusion & feasibility:** factors associated with **s**uccessful implementation: 1) active hospital leadership 2) an effective implementation team

IV = Independent variable; DV = Dependent variable

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Mitchell, S. E., Weigel, G. M., Laurens, V., Martin, J., & Jack, B. W. (2017). Implementation and adaptation of the Re-Engineered Discharge (RED) in five California hospitals: A qualitative research study. BMC Health Services Research, 17(1), 291-320. doi: 10.1186/s12913-017-2242-z	None Purpose: to identify and characterize contextual factors influencing how five California hospitals adapted and implemented RED and resulting effect on RED program sustainability	Qualitative: participant observation and focus group interviews Level: VI	Sample: 64 participants Setting: Five hospitals in northern California who implemented project RED	**IV**: RED Toolkit **DV**: continuation of toolkit after lapse of external funding	**IV:** RED Toolkit: adherence To 12 RED components **DV**: Sustainability: 6 months beyond the implementation period	Modified grounded theory approach with constant comparative analysis	External factors influencing RED adaptation and implementation: federal penalties for high readmission rates, access to external funding and technical support to help hospitals implement RED. Internal factors: committed leadership to RED, RED adaptations, accountability & influence of the implementation team sustainability planning and hospital culture. 3/5 hospitals continued RED beyond the implementation period.	**Weaknesses:** Only 5 hospitals surveyed all in the same geographic location; participants interviewed were selected by the hospital which may have skewed data; social desirability response bias may have occurred; length of site visit short and all desired interviews did not take place **Strengths:** mix of urban & suburban hospitals; numbers of beds; range of discharges 4356-16,905 **Conclusion**: Keys to sustainable implementation of the RED Toolkit: invested leadership, dynamic, interdisciplinary team; adapted implementation strategy; empowered hospital culture. Most successful teams had a champion over each component.

IV = Independent variable; DV = Dependent variable

Citation	Conceptual Framework	Design Method	Sample/Setting	Major variables studied (and their definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Clancy, C. M. (2013). New hospital readmission policy links financial and quality incentives. Journal of Nursing Care Quality, 28(1), 1-4.	None **Purpose**: to discuss tools, resources and technical assistance to address factors leading to hospital readmissions	Expert Opinion Level: VII	260 Project RED hospital sites	**IV1=** Re-engineered discharge (RED) Toolkit **IV2=** Better Outcomes for Older adults through Safe Transitions (BOOST) **DV:** hospital readmissions	**DV:** readmission within 30 days of discharge or visit to emergency department	None noted	Project RED: Patients discharged from the hospital with an understanding of their after-care instructions are 30% less likely to be readmitted within 30 days. BOOST showed a 21% reduction in 30-day all-cause readmission rates.	**Weaknesses:** No cost data **Strengths**: RED and BOOST have demonstrated a positive impact on all-cause readmission rates **Conclusion & feasibility**: Readmission rates put organizations at financial risk; evidence-based research (RED, BOOST) can be used to address conditions causing readmission

IV = Independent variable; DV = dependent variable

Citation	Conceptual Framework	Design Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Jack, B. W., Paasche-Orlow, M. K., Mitchell, S. M., Forsythe, S., Martin, J., & Brach, C. (2013). An overview of the Re-Engineered Discharge (RED) Toolkit. Prepared by Boston University under Contract No. HHSA290200600012i. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from: https://www.bu.edu/projectred/toolkit.html	None **Purpose:** Reduce readmission rates and emergency room visits by addressing health literacy issues	Expert Opinion Level: VII	None	**IV:** Discharge educator, After Hospital Care Plan, Post-discharge follow-up phone call (RED Toolkit) **DV:** Hospital readmission rates, emergency room visits	**DV:** Hospital readmission rates: not defined Emergency room visits: not defined	None noted	None reported on expanded toolkit however use of the RED Toolkit resulted in 30% fewer emergency room visits and hospital readmissions	**Weakness:** No data on effects of expanded toolkit. **Strengths:** enhanced to address language barriers, cross-cultural issues and disparities in health care communication and trust **Conclusion & feasibility:** Adapted toolkit can be used by hospitals to proactively address avoidable readmissions

IV = Independent variable; DV = Dependent variable

Citation	Conceptual Framework	Design Method	Sample/ Setting	Major variables studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Mansukhani, R. P., Bridgeman, M. B., Candelario, D., & Eckert, L. J. (2015). Exploring transitional care: Evidence -based strategies for improving provider communication and reducing readmissions. Pharmacy and Therapeutics, 40(10), 690-694.	None **Purpose**: to discuss evidence-based strategies for improving communication amongst providers and reducing readmissions	Expert opinion Level: VII	**Sample**: 749 **Setting**: none reported	**IV:** ReEngineered Discharge (RED) Toolkit; 12 components including medication reconciliation **DV:** hospital utilization	**DV:** hospital visits per person per month	Descriptive statistics	Medication reconciliation services promote patient satisfaction and improve treatment outcomes. Project RED: rate of hospitalization was reduced (0.314 versus 0.451 visits per person per month in intervention group vs. standard care group respectively). Incidence rate ratio 0.695; P=0.009	**Strengths:** Clear and comprehensive provider-patient communication using post-discharge telephone calls, telehealth services, and home visits is key to achieving optimal transition of care. Sufficient sample size. **Weaknesses:** bundled intervention; occurred at one hospital; no cost estimate **Conclusion & feasibility:** key considerations maybe feasible to implement

IV = Independent variable; DV = Dependent variable

Evaluation of Evidence

In the primary search, one systematic review examined thirty studies of hospitalized patients who received a personalized discharge plan from 1946-2015. In 12 trials an individualized discharge plan was shown to decrease length of stay with moderate certainty evidence while six trials with low certainty evidence demonstrated an improvement in patient satisfaction (Goncalves-Bradley et al., 2016). The effect of a discharge planning advocate on length of stay, readmission rate to the hospital, patient health status, patient satisfaction, and cost to the hospital was reported in another systematic review of over 8,000 participants (An, 2014). Results included a decrease in length of stay and increase in patient satisfaction.

A randomized control trial by Jack et al. (2009) studied the effect of the Re-Engineered Discharge (RED) Toolkit, a bundled intervention, on 749 hospitalized adult patients on a general medical service in a metropolitan hospital. A nurse discharge advocate, after hospital care plan, and phone call by a pharmacist several weeks after discharge were included in the intervention. The discharge advocate was responsible for educating patients about their discharge while coordinating the plan with the team. Patients reported improved self-perceived preparation for discharge and increased follow up with their primary care provider. The program also reduced hospital utilization. The Re-Engineered Discharge (RED) Toolkit is supported by the Agency for Healthcare Research and Quality (AHRQ) to improve the discharge process and number of hospital readmissions (AHRQ, 2017).

Two well-designed control trials without randomization included a structured discharge planning program. In a quasi-experimental study of 64 elderly patients (Haddock, 1994), a clinical nurse specialist (CNS) and social worker (SW) worked collaboratively to assess, plan,

and implement discharge planning using a structured protocol and the Long-Term Care Information System (LTCIS). The CNS and SW assessed the patient separately and were responsible for completing specific parts of the form. Daily meetings occurred to review the plan and determine what actions needed to be taken. Patients in the experimental group had higher rates of satisfaction, shorter length of stay, fewer readmissions, and a higher percentage of post discharge services.

Hadjistavropoulos, Garratt, Janzen, Bourgault-Fagnou, and Spice (2009) evaluated the use of a Continuity of Care Checklist (CCC) to assist nurses in improving the discharge process for orthopedic patients from the hospital to the community. Interviews about continuity of care were conducted with patients who were discharged from an orthopedic unit before the tool was implemented. A second group of patients were interviewed to determine changes in care after the CCC was implemented. Nurses were also interviewed to gather information about their experiences with CCC. Findings revealed significant improvements in the patients' perception of receipt of information, involvement of informal caregivers in the discharge planning process, communication between the hospital and community providers, information consistency, and satisfaction with patient-provider relationships.

Several descriptive studies looked to improve the patient experience and satisfaction through discharge planning. Bull, Hanse, and Gross (2000) utilized the Professional Patient Partnership Model of Discharge Planning (Bull, et al., 2000) in 134 heart failure patients in two large community hospitals. Discharge planning satisfaction was measured two weeks after hospitalization of elders and their family caregivers. The study found that the best predictors of satisfaction with discharge planning was continuity of care and the extent to which patients and caregivers felt prepared to manage care after discharge.

Gray, Santiago, Dimalanta, Maxton, and Aronow (2016) measured discharge time and patient satisfaction based on HCAHPS scores after implementing an interdisciplinary approach to discharge planning. The interdisciplinary team consisted of the unit manager, case manager, social worker, charge nurse, pharmacist, and clinical nurse. Unit discharges by 11 am increased and a positive correlation in patient satisfaction scores was noted. The team achieved these goals by streamlining the discharge process, improving the coordination amongst team members, and role clarification.

A Comprehensive Unit-based Safety Program (CUSP) was created to improve the patient experience by addressing care transitions and discharge processes in a 318-bed community hospital (Pottenger et al., 2016). Discharge processes were observed, and patient and staff interviews were conducted. Interventions included issuing Ready to Go cards, patient education on medication adherence, improved communication regarding process delays, and phone calls to patients after discharge. Ready to Go cards were given to patients early in their hospital stay to encourage them to think about their discharge needs and questions. Top scores for the discharge information and care transitions domain, and related items increased at least three percentage points. The percentage of patients rating the hospital top score of nine or ten increased by seven percentage points (Pottenger et al., 2016).

Wertheimer et al. (2014) achieved an improvement in discharge before noon (DBN) rate from 11% to 38% over a 13-month intervention (P=0.0002) through a tri-fold initiative: kick-off event to engage staff and clarify roles; daily updates to track DBN percentage; and interdisciplinary DBN checklist.

A variety of approaches have been taken to reduce length of stay. A quality improvement initiative to decrease length of stay for hip and knee replacement patients was undertaken across

five orthopedic units in a major Mid-West healthcare system (McCann-Spry, Pelton, Grandy, & Newell, 2016). Provider communication, consistent patient communication about length of stay (LOS) expectation, consistency in the use of the Risk Assessment and Prediction Tool (RAPT), and initiation of physical therapy on the day of surgery accounted for an average decrease in length of stay by 0.5 days.

The Symptoms, Medications, Appointments, Results, and Talk with me (SMART) discharge protocol is an Always Event developed by the Anne Arundel Medical Center to improve the discharge process and to ensure that these areas are always addressed at discharge with patients and families (Hayward, Endo, & Ruthford, 2014). The Institute for Healthcare Improvement (2017) defines Always Events as those behaviors that should occur every time for every patient in the healthcare system. The SMART discharge protocol was used in three inpatient units in a community hospital in Maryland (Hayward et al., 2014). Improvements were seen in patient satisfaction as reported in HCAHPS scores, readmission rate, and post hospital visit rate to the emergency department.

The critical appraisal of the evidence indicates that individualized discharge planning which includes the patient, leads to higher rates of patient satisfaction in HCAHPS scores, and can lead to decreased length of stay, and readmission rates. The randomized controlled study by Jack et al. (2009) demonstrated significant improvement in readmission rate and self-reported readiness for discharge using a discharge advocate, after hospital care plan, and follow up phone call.

Further exploration of the literature, in the second search, yielded analysis of components of the discharge planning process. In a systematic review, the topics of hospital discharge and readmission were examined in 110 studies from 1998-2017 (Alper, O'Malley, Greenwald,

Aronson, & Park, 2014). Elements of the discharge process studied included discharge planning, medication reconciliation, discharge summary, patient instructions, and a discharge checklist. The effect of discharge planning examined in a 2010 systematic review demonstrated improved patient satisfaction, small decreases in readmission rates and length of stay, and unchanged mortality rates. While medication reconciliation was attributed to a decrease in adverse drug events in most studies, it's influence on reducing hospital readmissions, and post-discharge emergency room visits was inconclusive. The importance of the discharge summary was evident in a retrospective, single-center study where higher rates of readmission were associated with a three-day delay in the completion of the discharge summary. Patient instructions at discharge should be in the client's language, brief, and appropriate to the level of health literacy. The patient's level of understanding for care after discharge should be assessed prior to discharge. Teach back, a method to validate understanding of current information, has not been studied to reduce 30-day readmissions. In preparing patients for discharge the use of a checklist is often used. The effectiveness of the discharge checklist on readmission rates has not been studied.

Many readmissions are avoidable. In a systematic retrospective review of 34 studies as cited in Alper et al. (2014), the range of avoidable readmissions was five to 79 percent, with a median of 27 percent. In a study of 12 academic medical centers, more than a quarter of 1000 general medicine readmissions within 30 days of discharge were potentially preventable. Several factors were strongly associated with potentially preventing readmissions: emergency department decision-making about readmission, pre-mature discharge, and lack of discussion about the goals of care with patients who had a serious illness.

Approaches to re-engineer the discharge process have been developed. Alper et al. (2014) note that in a 2011 systematic review of 43 studies, a significant decrease in readmission

rates was found in five of 16 randomized control trials. Multi-pronged approaches including patient-centered discharge instructions and a phone call after discharge were noted in four of the five successful studies. Post-discharge telephone calls by various health care team members have been effective in reducing visits to the emergency department and improving follow-up with primary care providers. The use of home visits and telemonitoring has demonstrated varying level of effectiveness in readmission rates. Successful interventions to reduce readmission tend to be multifaceted. In a randomized control trial of 749 patients in a large academic hospital, the rate of post-hospital utilization was 31 percent for the intervention group using the Re-engineered (RED) Toolkit and 44 percent for the control group. Components of the toolkit consisted of a nurse discharge planner, pharmacist for post-discharge medication follow-up, medication reconciliation, scheduled follow-up appointments, and low-literacy discharge instruction booklet.

Two quality improvement projects implemented the Re-engineered (RED) Toolkit and saw reductions in their 30-day readmission rates. Adams, Stephens, Whiteman, Kersteen, and Katruska (2014) assessed the use of the RED Toolkit on 30-day all cause readmission rate and patient and family involvement in the discharge process in a 30-bed medical-surgical unit in a rural community hospital. The sample consisted of 336 patients over a four-month period. An interdisciplinary team consisting of internal and external community providers evaluated the current discharge practices against Project RED. A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, Suppliers, Inputs, Process, Outputs, and Customers (SIPOC) analysis, and a cause and effect diagram were completed to examine other issues related to the discharge and readmission processes. As a result, practice changes were instituted that included the establishment of a Patient Communication Folder (PCF) and After Hospital Care Plan (AHCP)

booklet. Patients were asked to complete a questionnaire prior to discharge and upon readmission to the hospital. 24 % of patients completed the discharge questionnaire prior to discharge. While patient and family perception of the discharge process was positive, the monthly patient and family involvement rate in post discharge planning was not strong, ranging between 0.766 and 0.896. Of note is that the involvement rate reflects aggregate not unit specific data. The hospital experienced a 32% reduction in readmission rate during the four-month project period. After the completion of the project the changes were incorporated throughout the hospital. Cost data was limited but expenses were attributed to staff education, educational materials, and personnel time to complete post discharge phone calls. Total expenditures were less than the average readmission penalty which would be charged to the hospital totally $5793 per readmission.

Markley et al. (2013) sought to reduce the 30-day all-cause readmission rates of Medicare beneficiaries by two percent through a community-wide effort of hospitals and post-acute care providers in southern Texas. The sample initially included heart failure patients admitted to the telemetry unit but then expanded to all patients across the hospital. A team consisting of individuals from quality improvement and data analysis worked with five hospitals who volunteered to participate in the project. All hospitals implemented the same interventions and all patients in the target samples received them, irrespective of insurance type. Post-acute care providers in the area were encouraged to participate in the project since they receive a portion of the hospital's discharges and contribute to the 30-day readmission rate. Quarterly meetings were held between the team and post-acute providers to collaborate on ways to reduce avoidable readmissions. A root cause analysis of the hospital's high readmission rate was conducted by the quality improvement team. Project RED was chosen by the hospitals to reduce readmission

rates. The hospitals began by selecting two to four components of the model to implement in the target population and then expanded the interventions across populations once success was achieved. The nursing, pharmacy, and case management departments shared responsibility for implementing the interventions. Concurrent monthly monitoring of 30-day readmission rates for the target group and across the facility was conducted. A patient discharge survey was also administered to measure the patients' sense of their care and completion of Project RED interventions. The model was effective in reducing the 30-day readmission rate by 8.3 percentage points from 23.3% to 15 % (P=.002) for all Medicare fee for service across the facility. Elements of project success were attributed to strong project leadership, spreading interventions across the organization, engaging post-acute community care providers, and concurrent monitoring of outcomes.

In the first study to examine the implementation experiences of hospitals after implementing Project RED, Mitchell et al. (2016) recruited 10 hospitals from different areas across the United States to study the facilitators and barriers to the RED program. The hospitals were a mix of community, for-profit, academic, and non-academic organizations. Senior leadership and hospital implementation teams received Project RED training, software installation, and technical assistance. Institutions could also participate in monthly group conference calls. Readmission rates for participating hospitals were collected before and after RED implementation. On-site interviews were conducted with key informants from each hospital prior to implementing RED and one year later. Data were analyzed using the constant comparative method. Recurring themes included variability in adherence to implementing RED; elements related to successful implementation; challenges of successful implementation; and the impact of RED implementation. Seven hospitals who successfully implemented RED

experienced a reduction in the 30-day readmission rate for at least one of three diagnostic groups (congestive heart failure, acute myocardial infarction, and pneumonia). Committed leadership, well-functioning interprofessional teams, established methodology to share results and assess accountability, staff and stakeholder buy-in, and flexible information technology support were factors associated with successful implementation of RED. Scheduling timely follow-up appointments, sending discharge summaries to outpatient providers, and leveraging information technology were challenges to implementation. In addition to reported reductions in readmission rates, several organizations reported improving the organizational culture.

In a subsequent qualitative study by Mitchell, Weigel, Laurens, Martin, and Jack (2017), the researchers used participant observation, key informant, and focus group interviews with 64 participants across five hospitals in northern California to identify how they adapted and implemented project RED, and the resulting effect on program maintenance. The hospitals were a mix of urban and suburban organizations. Hospital type included military, community, tertiary care, non-profit, and teaching/academic. Number of beds ranged from 174 to 375. Annual average discharges amongst all facilities ranged from 4,356 to 16, 905. The research team, from Boston University where Project RED originated, provided a one-day training on the toolkit to each hospital's implementation team. Resources on how to implement, monitor, and measure RED outcomes was also included. Site visits were conducted at each hospital to observe the discharge process in action and to gain insight on the experiences of those implementing the toolkit. Fidelity was defined as adherence to the 12 components of the toolkit or adaptation thereof without changing the objectives of each component. Sustainability was defined as continuation of the toolkit six months beyond the implementation period. Three out of five hospitals continued RED beyond the implementation period. Data was analyzed using a

modified grounded theory approach with constant comparative analysis. Keys to sustainable implementation of the RED Toolkit included committed leadership to RED, who viewed the approach as a transformational process rather than a project; a dynamic, accountable, interdisciplinary, implementation team; a high adherence to the protocol; and an empowered hospital culture. Most successful teams had a champion over each RED component.

Financial and quality incentives are driving hospitals to address the issue of hospital readmissions. Clancy (2013) cites the work of Brian Jack, MD, and Mark V. Williams, MD in developing research projects, supported by the Agency for Healthcare Research and Quality (AHRQ), aimed at improving the hospital discharge process and reducing readmissions. The RED Toolkit and Better Outcomes for Older adults though Safe Transitions (BOOST) have demonstrated a positive impact on all-cause readmission rates. Patients discharged from the hospital utilizing Project RED who understood their after-care instructions were 30% less likely to be readmitted within 30 days. Findings from project BOOST showed a 21% reduction in 30-day all-cause readmission rates. Jack et al. (2013) further enhanced the toolkit to address language barriers, cross-cultural issues, and disparities in health communication and trust. Mansukhani, Bridgeman, Candelario, and Eckert (2015) identified evidence-based strategies for improving provider communication and reducing readmissions. The use of standardized discharge forms, health information technology, and accurate medication reconciliation can assist in providing clear and comprehensive provider-patient communication. Effective transitional care services also include post-discharge telephone calls, home visits, and telemedicine. Medication reconciliation is a key factor in the transition process. The Re-engineered (RED) Discharge Project has 12 components which includes confirming medication reconciliation. Medication reconciliation services promote patient satisfaction and improves

treatment outcomes. In Project RED the rate of hospitalization was reduced 0.314 versus 0.451 visits per person per month in intervention vs. standard care group respectively. Incidence rate ratio 0.695; P=0.009.

Despite the evidence that indicates the need for patient discharge planning, there is no consensus in the literature on what discharge planning process is best or who should lead the initiative. Limited research has been generated on the effect of the nurse in discharge planning (An et al., 2014) although a clear definition of the role of the nurse appears to contribute to improved outcomes (Gray et al., 2016; Hayward et al., 2014; Jack et al., 2009; Wertheimer et al., 2014). The use of an advanced practice nurse has been found to have a positive impact on rates of satisfaction, readmissions, and length of stay (Haddock, 1994; Naylor et al., 1999). Several studies point to success by using an interdisciplinary approach to discharge planning (Jack et al., 2009; Haddock et al., 1994; Gray et al., 2016; Pottenger et al., 2016; Wertheimer et al., 2014; McCann-Spry et al., 2016; & Hayward et al., 2014).

The highest level of evidence (Goncalves-Bradley et al., 2016) indicates that an individualized discharge plan has the greatest impact on length of stay and satisfaction. Studies that engaged the patient in the discharge planning process through education and other methods of communication yielded favorable outcomes such as improved satisfaction (Bull et al., 2000; Pottenger et al., 2016; Hayward et al., 2014), self-reported preparation for discharge (Jack et al., 2009), and decreased length of stay (Wertheimer et al., 2014; McCann-Spry et al., 2016).
The use of a checklist or protocol also appeared to play a role in the success of the discharge planning process (Haddock, 1994; Hadjistavropoulos et al., 2009; Wertheimer et al., 2014; Hayward et al., 2014).

Several studies included multiple interventions (Jack et al., 2009; Haddock et al., 1994; Hadjistavropoulos et al., 2009; Pottenger et al., 2016; McCann-Spry et al., 2016; Wertheimer et al., 2014) making it difficult to determine the effect of each intervention on the results. Further study is needed to determine what factors in the discharge planning process have the greatest effect on outcome measures.

Synthesis of Evidence

Eight evidences ranged from I to VII were evaluated and synthesized in Table 2 presenting the effectiveness of the RED toolkit on discharge outcomes which include 30-day readmission rate, length of stay, patient satisfaction, readiness for discharge, primary care provider follow up, and knowledge for self-management. The synthesis of the evidence indicates the RED Toolkit has shown promise in reducing hospital readmission, decreasing length of stay, improving patient satisfaction, increasing readiness for discharge, and improving knowledge for self-management.

The RED toolkit should be patient-partnered, involving the patient and family caregivers. A successful discharge transition includes multiple concurrent strategies rather than a single element. Successful implementation and sustainability of the toolkit has been associated with strong leadership support, fidelity to the toolkit components, an empowered hospital culture and an accountable, dynamic interdisciplinary implementation team (Mitchell et al., 2017). A synthesis table summarizes the information from the review of the literature and is found in Table 2.

Table 2

Synthesis of the Effectiveness of the RED Toolkit on Discharge Outcomes

Citation	Discharge Planning Intervention	Outcomes						Level	Study Design	Sample
		30 -day readmission rate	LOS	Patient Satisfaction	Readiness for DC	PCP follow up	KSM			
Alper et al.	Personalized DC plan	↓	↓	↑	↑			I	Systematic Review	110 studies
	Post DC phone call					↑				
	RED Toolkit	↓			↑	↑				
Adams et al.	PCF AHCP	↓		↑				VI	QI	336
Markley et al.	RED Toolkit	↓						VI	QI	5 hospitals
Mitchell et al. (2016)	RED Toolkit	↓						VI	Qualitative & descriptive	10 hospitals
Mitchell et al. (2017)	RED Toolkit			↑				VI	Qualitative	64
Clancy	RED Toolkit	↓						VII	Expert Opinion	260 hospitals
Jack et al. 2013	DC educator & AHCP	↓					↑	VII	Expert Opinion	None reported
Author 8 Mansukhani et al.	RED Toolkit	↓		↑				VII	Expert Opinion	749

DC = Discharge; PCF = Patient communication folder; AHCP = After Hospital Care Plan booklet; QI = Quality Improvement; ED = Emergency Department; PCP = Primary Care Provider; KSM = Knowledge for Self-Management; LOS = Length of Stay; Unk = unknown; RED = Reengineered discharge

Recommendation for Practice Change

The evidence indicated the RED Toolkit influenced patient outcomes relative to length of stay and patient experience as reflected in HCAHPS scores addressing satisfaction with discharge planning. To ensure a positive patient experience and improve outcomes at the organizational level, the development of a discharge planning process was recommended using the following guidelines from the RED Toolkit (Jack et al., 2009; AHRQ, 2017):

- Assign responsibility to coordinate all aspects of the hospital discharge plan for joint patients through the establishment of a discharge educator(s);
- Develop a written plan of care for the patient after discharge in accordance with the patient's level of health literacy;
- Conduct follow up phone call 72 hours after discharge

Internal evidence manifested in poor HCAHPS scores, patient flow bottlenecks, readmission rate, and a latent discharge process triggered a call to action. The initiative aligned with the organization's vision, goals, and strategic initiatives. The mission of the organization is to improve the human condition through the provision of patient-centered quality care. The vision of the organization includes redefining standards of excellence in health care through a team approach, improving the human condition, promoting knowledge through excellence in scholarship, exploration and involvement, serving as a diverse, student-focused public research institution (uthealth.utoledo.edu, 2018).

Methods

The purpose of the DNP project was to determine if on an orthopedic unit, in an acute care setting, the use of the RED Toolkit, compared to not using the RED Toolkit, affected staff RED Toolkit compliance rate, discharge time, knowledge for self-management, patient

satisfaction with the discharge process, patient readiness for discharge, and 30-day readmission rate for hip and knee joint replacement and revision patients. The goal of the project was to utilize the RED Toolkit to contribute to patient-centered outcomes and to improve the discharge planning process.

Project Setting

The setting for this project was an orthopedic unit in a tertiary care hospital in the Midwest. The mission of the organization is to improve the human condition through the provision of patient-centered, quality care. The unit has 30 private rooms. The facility is in an urban environment and is classified as a university health care hospital. There are 12 orthopedic physicians, two of whom primarily perform hip and knee surgery. Staff on the orthopedic unit consists of a unit director, lead nurse, staff nurses, nursing assistants, orthopedic case manager, physical therapist, occupational therapist, social worker, and resource utilization coordinator. The interdisciplinary team is in place to address the discharge planning needs of this population.

Participants

Patient inclusion criteria were adult patients who underwent a hip or knee joint replacement or revision surgery. Patients admitted to the orthopedic unit with these procedures were considered for the project. Ineligible subjects were those under the age of 18 and without a hip or knee joint replacement or revision. 36 individuals were invited to take part in the project but only 30 gave consent to participate. Subject demographics include gender, age, payer type, level of education, and diagnosis and are displayed in Table 3. Of the 30 subjects, 12 (40%) were male and 18 (60%) were female. The age of participants ranged from a minimum of 47 years of age to a maximum of 78 years of age. The mean age was 63.03 years and a standard deviation of 8.45. Payer type included 53.3% private insurance and 46.7% Medicare. Of the 30

subjects, 6 (37.5%) reported a high school education or general education diploma (GED), 6 (37.5%) reported some college and 4 (25%) were a four-year college graduate or higher. Most participants had joint replacement surgery; 11 (36.7%) had a total knee replacement; 10 (33.3%) had a total hip replacement; 5 (16.7%) had knee revision surgery and 4 (13.3%) had hip revision surgery.

Table 3

Demographics of Project Population (n=30)

Characteristics	n (%)
Gender	
Male (%)	12 (40%)
Female (%)	18 (60%)
Age	
Range	47-78
Mean (SD)	63.03 (8.45)
Payer Type	
Private	16 (53.3%)
Medicare	14 (46.7%)
Education	
Less than high school	
Some high school	
High school graduate or GED	6 (37.5%)
Some college	6 (37.5%)
4-year college grad or higher	4 (25%)
Diagnosis	
Total knee replacement	11 (36.7%)
Total hip replacement	10 (33.3%)
Knee revision	5 (16.7%)
Hip revision	4 (13.3%)

Implementation Process and Evaluation Using the EBPI Model

The implementation process for this project is outlined using the Evidence-Based Practice Improvement (EBPI) model (Levin et al., 2010). The EBPI model integrates evidence-based practice and performance improvement into one model (Levin et al., 2010). The model consists of seven steps and allows for the practice change to be "tested" as a pilot. The outcomes and lessons learned through tests of change can be used for system wide integration of the practice change. Each step of the process is described and assigned a time frame for completion. Steps one through four include description of the practice problem, development of a focused clinical question, searching for the highest level of evidence, and critical appraisal and synthesis of literature. The subsequent steps are to develop a goal statement, the plan-do-study-act cycle, and disseminate best practice (Levin et al., 2010).

Description of the Problem. The first step in the process is to describe the practice problem. Levin et al. (2010) point out the importance of understanding the problem in a larger context. This can be done by examining internal organizational data and literature relevant to the problem. This step includes determining the effect of discharge planning on the healthcare system in addition to the impact on the organization where the practice change will be carried out.

The impact of discharge planning on the healthcare system was conducted by the doctoral student in the Spring of 2017. It was determined that the discharge planning process had a significant impact on discharge time, patient satisfaction and perceived readiness for discharge. A needs assessment was conducted with the project agency in the Spring of 2017. Hip and knee replacement and revision readmission rates within the organization was gathered in the Fall of 2017 and determined to be greater than desired at 6%. Patient satisfaction rates for this

population specific to discharge planning was 33% and readiness for discharge as reported by the orthopedic case manager was 2%.

Formulate Focused Clinical Question. A focused clinical question is formulated using the PICO format as the second step of the EBPI model (Levin et al., 2010). (P) represents the population, patient, or problem that is being studied; (I) represents the intervention that is being evaluated; (C) represents what the intervention is being compared to; (O) represents the outcome (Levin et al., 2010). The clinical question for the project was developed by the doctoral student in the Spring of 2017. The PICO question for the project was: Among adult patients on an orthopedic unit undergoing a hip or knee joint replacement or revision how does the use of the RED toolkit, compared to current practice, affect staff RED Toolkit compliance rate, discharge time, knowledge for self-management, patient satisfaction with the discharge process, patient readiness for discharge, and 30-day readmission rate?

Search, Appraise and Synthesize the Evidence. The third step of the model is to search for the highest quality of evidence to answer the practice question. The levels and quality of evidence need to be determined in this stage (Levin et al., 2010). After the search for evidence, the literature is critically reviewed and summarized (Levin et al., 2010). The doctoral student conducted an initial literature search in the Spring of 2017 and further refined the search to focus specifically on the use of the RED Toolkit in a subsequent search in the Summer of 2017. The articles were critically appraised, evaluated and summarized using the rapid critical appraisal method by Melnyk and Fineout-Overholt (2015) and displayed in tables as previously noted. Nineteen articles were used as evidence for the DNP project with levels of evidence ranging from a level one to a level seven.

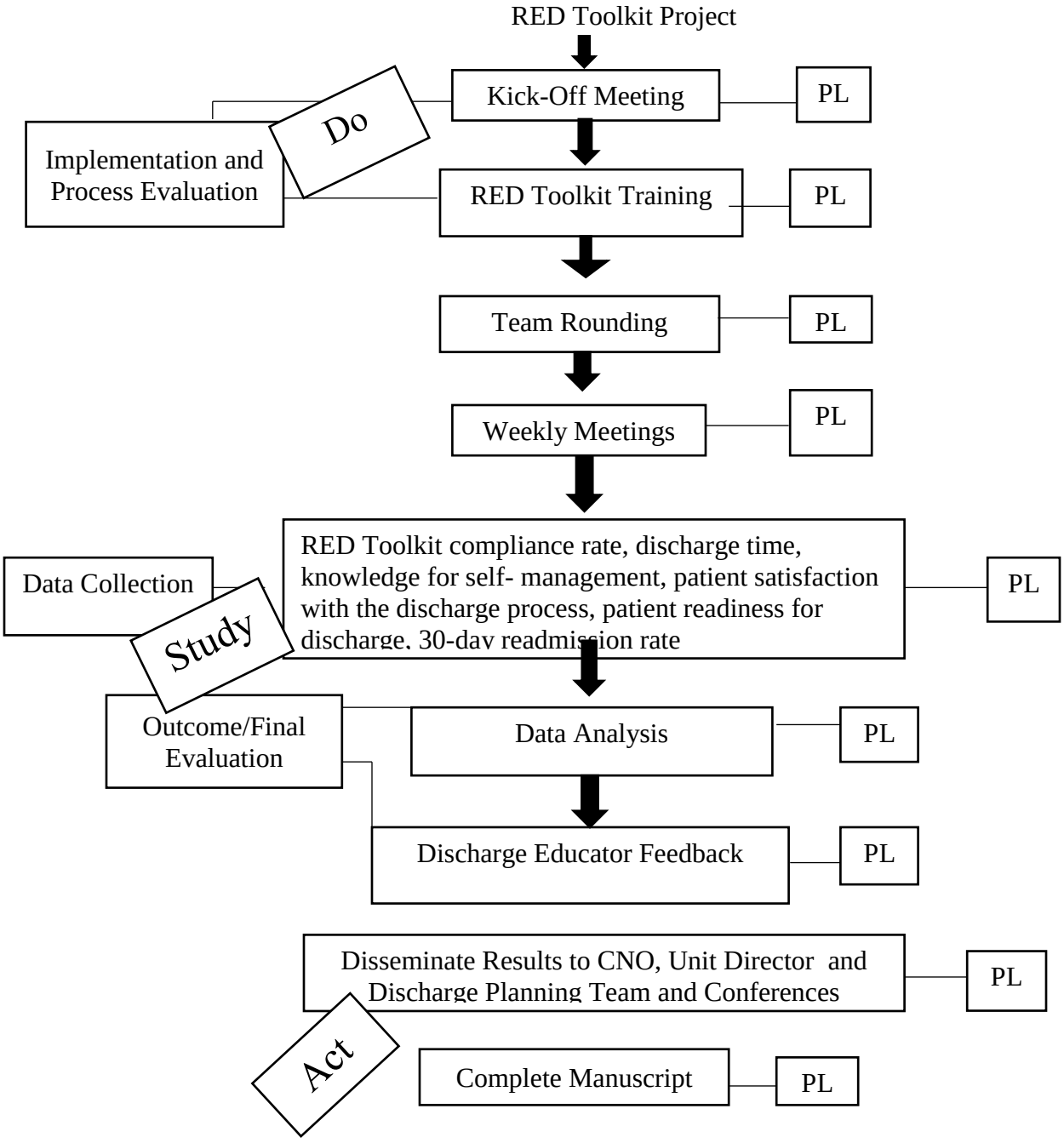
Develop a Goal Statement. The purpose of the goal statement is to direct efforts towards a targeted result (Levin et al., 2010). It should include a desired outcome and performance in measured terms (Levin, et al., 2010). The goal of the project was to have the RED Toolkit as the standard of care for all patients to improve the discharge planning process. The outcome indicators, or measures of achievement, were staff compliance with RED Toolkit, improved discharge time, increased patient knowledge for self-management, improved patient satisfaction with the discharge process, increased patient readiness for discharge and decreased 30-day readmission rate. The operational goals were to achieve a 100% staff compliance rate with the RED Toolkit and patient knowledge for self-management, a nine or ten rating in the areas of patient satisfaction with the discharge process and patient readiness for discharge, and a readmission rate of 3%. The desired benchmark for discharge time was less than two hours or before 11:00 a.m.

Plan-Do-Study-Act (PDSA) Cycle.

Plan. After the development of an aim statement, the team conducts small tests of change using the Plan-Do-Study-Act (PDSA) cycle. The PDSA cycle, part of the Institute for Healthcare Model for Improvement, consists of four steps (AHRQ, 2013). In the planning phase, preparations are made for carrying out the change including data collection steps (AHRQ, 2013). The "Do-Study-Act" portions of the EBPI implementation process are displayed in Figure 2.

Figure 2

Implementation Process of "Do, Study, Act" Phases of RED Toolkit Project



PL = Project Leader

The support of senior management for the project was integral to the process. A planning meeting was held with the Chief Nursing Officer in December of 2017 to review the purpose and goals of the project, discuss outcome measures, and implementation team members. A letter of support was secured for the project (Appendix A). IRB approval was obtained prior to implementation of the project in February of 2018. The plan phase of the project took place in the Spring 2018. The steps for implementation of the Re-Engineered (RED) Discharge Toolkit were based on the AHRQ guidelines for its use (2017). The first step is to communicate with all key stakeholders. Meetings were held with the CNO and unit director to discuss the project. The CNO and unit director determined that the lead nurses on the unit would best serve in the role of discharge educator. An email to introduce stakeholders to the project and inviting them to a kick-off meeting was developed. Critical components of the email included the essence of the project, purpose of EBP, any required preparation for the meeting, meeting date, time and location, why their attendance was important, request for RSVP, and thanking them for their participation. The second step is identification of implementation leadership. The implementation team included the Chief Nursing Officer (CNO), unit director, project leader, lead nurses and the orthopedic case manager. The project leader directed the implementation process and conducted the team meetings. At the executive level, the Chief Nursing Officer serves as the readmission reduction champion and was responsible for overseeing the project. An interdisciplinary discharge planning team was in place on the orthopedic unit and consisted of the lead nurse, orthopedic case manager, social worker, physical therapist, occupational therapist and utilization review nurse. The team met Monday through Friday to discuss the discharge planning needs of each patient on the unit. The third step of the plan is to analyze the readmission rates and determine a goal. The CNO set a target to reduce the readmission rate for

hip and knee replacement and revision patients by three percent. A representative from Quality Management was responsible for data collection of readmission rates. The fourth step includes creating a process map of the current discharge process and revising the current discharge workflow to eliminate duplication. A process map of the discharge process was conducted in the Spring 2017 and was revisited with the interdisciplinary discharge planning team at the kick-off meeting to verify that no changes occurred. Since the hospital planned to implement a new electronic medical record in the next year the after-hospital care plan was manually produced and not considered a permanent part of the medical record. The discharge instructions completed by the physician included some of the same information in the after-hospital care plan. Since the project was a pilot, it was determined that no changes would be made to the discharge documents. In the fifth step, responsibility for RED components is assigned. Step five occurred during the kick-off meeting. RED components were reviewed and compared to current practice and responsibility assigned. This is displayed in Table 4.

Table 4

RED Staff Assignment Planning Chart

RED Component	**Person Responsible**
1. ascertain need for and obtain language assistance	Lead nurse
2. make appointments for follow up care	Unit clerk
3. plan for the follow up results from tests or labs that are pending at discharge	Lead nurse
4. organize post discharge outpatient services and medical equipment	Social worker, orthopedic case manager, therapy
5. identify the correct medicines and a plan for patients to obtain them	Pharmacy
6. reconcile the discharge plan with national guidelines	Lead nurse
7. teach a written discharge plan the patient can understand	Lead nurse, orthopedic case manager

8. educate the patient about his or her diagnosis and medicines	Lead nurse, orthopedic case manager
9. review with the patient what to do if a problem arises	Lead nurse, orthopedic case manager
10. assess the degree of understanding of the discharge plan	Lead nurse orthopedic case manager
11. expedite the transmission of the discharge summary to the clinicians accepting the patient within 24 hours of discharge	Unit clerk
12. provide telephone reinforcement of the discharge plan	Orthopedic case manager

A significant part of the planning phase included organizing and training discharge educators, follow-up telephone caller, and other stakeholders. A kick-off meeting was organized to introduce the RED Toolkit, discuss the goal, implementation timeline, education plan, assign RED components, review the discharge workflow, generate the after-hospital care plan, and discuss outcome documentation. Eight individuals attended the initial kick-off meeting including the Chief Nursing Officer and unit director which represented 66.6% of the interdisciplinary team. One absence was due to a scheduled day off. Lunch was provided by nursing administration. The kick off meeting occurred on the unit and was delivered face to face utilizing a power point presentation. The CNO reviewed the content of the presentation prior to delivery. The kick off meeting lasted two and a half hours. Because of feedback, changes were made to the after-hospital care plan to incorporate commonly used contact information given to orthopedic patients and the smoking cessation number. Since all lead nurses could not attend the kick off meeting, individual sessions were conducted with the three nurse leaders on their scheduled shifts. These sessions lasted one and a half hours each.

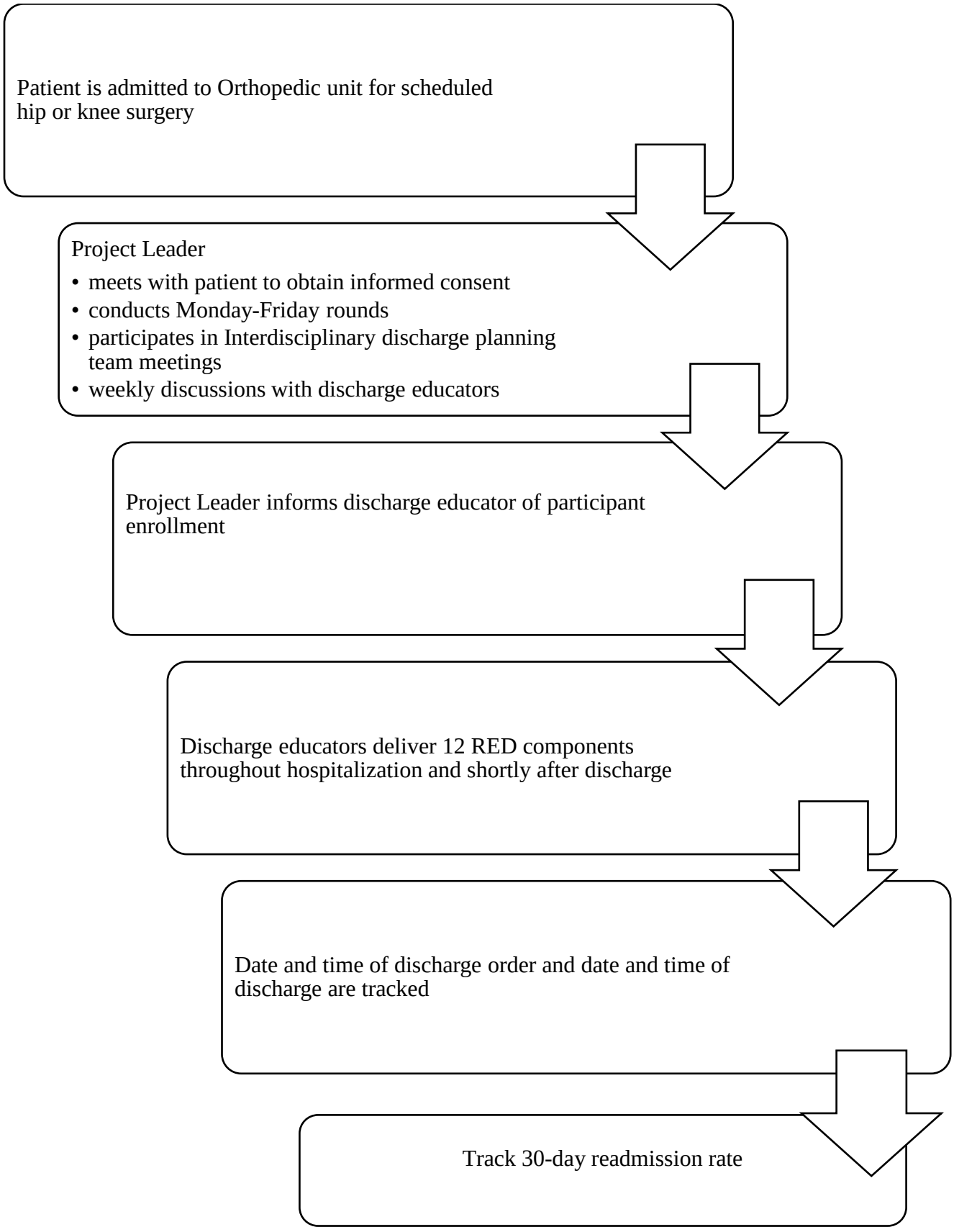
The project leader was responsible for completing educational instruction. The education plan included background of the tool, team roles and responsibilities, after-hospital care plan, post discharge follow up phone call, and outcome measures. Four face to face power point

training sessions were held for the nurse leads and orthopedic case manager who assumed the role of discharge educators. The CNO reviewed the power point materials prior to instruction. Education sessions were delivered in the unit conference room to enable staff to remain in the patient care area over a number of dates and times. Sessions were one hour in length with 30 minutes for questions and answers afterwards. A copy of the RED Toolkit was available on the unit and included an overview of the toolkit, role of discharge educator, after-hospital care plan, follow up phone call strategies and clinical practice guidelines on the surgical management of osteoarthritis of the hip and knee.

Marketing materials were created in concert with the roll-out of the project. This included development of a branding strategy using red as the predominant color for instructional materials for staff as well as the use of a red folder for the patient's AHCP. A brand identity including the slogan "Ready for Discharge" was used with an image of a house on stickers for staff training and education materials.

Do. The "do" phase is where small tests of change are conducted (AHRQ, 2013). The "do" phase consisted of providing the RED components to patients admitted to the orthopedic unit for hip or knee replacement or revision surgery by those serving in the role of discharge educators. This phase also included daily attendance at the interdisciplinary discharge planning meetings and weekly discussions with the discharge educators to determine adherence. This step started in April of 2018 after IRB approval and education of the staff. The goal was to implement the RED Toolkit on 30 patients. 36 patients were approached to take part in the project and 30 provided informed consent to participate. Figure 3 illustrates the flow chart of the "do phase." Appendix B outlines the detailed implementation procedure.

Figure 3
Flow Chart of Do Phase



Five lead nurses served in the role of discharge educator. Lead nurses served the unit through their clinical leadership and typically did have a patient care assignment. They were responsible for admitting new patients and assisting with the work flow of the unit. One lead nurse was assigned to each shift. Two of the lead nurses were assigned to the day shift, two to the night shift, and one rotated. Scheduled hip and knee surgeries occurred on Mondays, Tuesdays and Thursdays. Patients returned to the unit from surgery on day shift as well as night shift. The night shift lead nurses stated that it was uncommon for patients to be discharged after 7:00 pm. Therefore, they anticipated minimal involvement with the discharge planning process. The orthopedic case manager was an already established role conducting pre and post op education and as well as follow up phone calls for hip and knee joint replacement and revision patients for two orthopedic physicians. The orthopedic case manager also served in the role of discharge educator for the project and determined that the majority of RED components were part of her job responsibilities and expressed reluctance to relinquish them to other members of the team. Although the orthopedic case manager saw value in completing the RED components, time and patient volume were barriers.

Process evaluation occurred during the "do" phase and was carried out by rounding on the orthopedic unit Monday through Friday, attendance at the discharge planning meetings, as well as weekly discussions with the day lead nurses and orthopedic case manager. Process evaluation was conducted addressing discharge educator questions about the process and providing clarification as necessary. Questions surfaced about need to conduct a follow up phone call if the patient was see in the clinic within the 72-hour time frame post discharge or if they were discharged to a facility.

Study. Data analysis and an examination of results occurs in the study phase of the PDSA cycle (AHRQ, 2013). The flash drive was stored in a locked file cabinet at the University of Toledo College of Nursing in the home office of the primary investigator when not in use. All paper checklists and digital data on the USB drive will be kept in the primary investigator's office for a period of five years per the University of Toledo protocol and destroyed after that time limit. The contents of the flash drive were shared only with authorized members of the team for review and analysis.

Final evaluation included results from outcome measures and feedback from the discharge educators. Staff RED Toolkit compliance rate, discharge time, patient knowledge for self-management, patient satisfaction with the discharge process, patient readiness for discharge, and 30-day readmission rate were measured and analyzed. The RED Toolkit compliance rate was measured as the percentage of hip and knee joint replacement and revision patients who received all RED components. Discharge times were collected and measured from the time the provider wrote the discharge order to the time the patient left the unit. Discharge time data was provided by the unit director. Knowledge for self-management was measured by those patients who completed a post discharge follow up phone call and correctly report the reason for their hospital visit, symptoms to watch for, or things to do for their condition, and how to correctly take their medicines. Patient satisfaction was measured as the percentage of hip and knee joint replacement and revision patients who rate their satisfaction with the discharge process a 9 or 10 on a 1-10 scale during the follow up phone call. Patient readiness was measured as the percentage of hip and knee joint replacement and revision patients who rate their readiness for discharge a 9 or 10 on a 1-10 scale during the follow up phone call. The 30-day readmission rate was measured by the percentage of all cause readmissions within 30 days of discharge.

Readmission data was provided by the quality management department. The Outcome Indicators, Measurement, and Statistical Analysis are found in Table 5.

Table 5

Outcome Indicators, Measurement, and Statistical Analysis

Outcome	**Measurement**	**Statistical Analysis**
Staff Compliance	Percentage of hip and knee patients who receive all components of the RED Toolkit	Descriptive Statistics
Discharge Time	From the time the provider writes the discharge order to the time the patient leaves the unit	Descriptive Statistics
Knowledge for Self-Management	Percentage of patients who correctly report during post discharge follow up phone call the reason for their hospital visit (of those who completed a post discharge follow up phone call)	Descriptive Statistics
	Percentage of patients who correctly report during post discharge follow up phone call the symptoms to watch out for or things to do for their conditions (of those who completed a post discharge follow up phone call)	Descriptive Statistics
	Percentage of patients who correctly report during a post discharge follow up phone call how to take their medication (of those who completed a post discharge follow up phone call)	Descriptive Statistics
Patient Satisfaction	Percentage of hip and knee patients who rate their satisfaction with the discharge process a 9 or 10 on a 1-10 scale during the follow up phone call	Descriptive Statistics

Patient Readiness for Discharge	Percentage of hip and knee patients who rate their readiness for discharge a 9 or 10 on a 1-10 scale during the follow up phone call	Descriptive Statistics
30-day Readmission rate	Percentage of all cause readmission (admission > 24 hours) within 30 days of discharge	Descriptive Statistics

Results. Staff compliance and patient-centered outcome results are discussed and displayed below. Descriptive statistics were used to analyze the quantitative data.

Staff Compliance with RED Toolkit. Table 6 displays the outcome measures for staff compliance with the components of the RED Toolkit. The RED Toolkit compliance rate was 26 (86.8%) out of 30 participants. Scheduling appointments for follow up care was 26 (86.8%) out of 30 participants. The orthopedic surgeon served as the primary care provider for the project population. In three cases the discharge educators reported that the patients left the unit before they completed the after-hospital care plan. Subsequently there was no evidence of component completion on the checklist for several indicators.

Table 6

Staff Compliance with RED Toolkit (n = 30)

Number of RED components completed	**Frequency**	**Percent**
2	1	3.3
4	1	3.3
7	1	3.3
11	1	3.3
12	26	86.8
Total	30	100

Compliance with follow up phone call was 30 (100%) out of 30 participants but the 72-hour time frame was achieved in only 14 (46.7%) out of 30 participants and is displayed in Table 7.

Table 7

Follow up Phone Call (n=30)

Follow up phone call completed within 72 hours	**Frequency**	**Percent**
Yes	14	46.7
No	16	53.3
Total	30	100

Discharge Time. The distribution of discharge time ranged from .50 hours to 11.01 hours. On average the patient was discharged 5.67 hours after the provider wrote the discharge order with a standard deviation of 2.52. Three patients were discharged less than 2 hours after the discharge order was written. 12 patients were discharged between 3-6 hours after the written discharge order. 15 patients left the unit more than six hours after the discharge order was written. This is displayed in Table 8.

Table 8

Discharge Time (n=30)

Distribution of Discharge Time	**Frequency**	**Percent**
Less than 2 hours	3	10
3-6 hours	12	40
More than 6 hours	15	50
Total	30	100

Knowledge for Self-Management. Knowledge for Self-Management was collected for 27 of 30 (90%) participants. Patient knowledge for self-management was highest in the areas of knowledge of diagnosis and symptoms to report. Both categories were at 92.6% for 25 out of 27 participants. Participant knowledge of how to correctly take medications was 85.2% or 23 out of 27 participants. Data is reflected in Table 9.

Table 9

Knowledge for Self-Management (n=27)

Outcome Measure	Frequency	Percent
Knowledge of Diagnosis		
full understanding	25	92.6
partial understanding	2	7.4
Total	27	100
Knowledge of symptoms		
correctly reported symptoms to watch for	25	92.6
did not know symptoms to report	2	7.4
Total	27	100
Knowledge of medications		
correctly reported how to take medications	23	85.2
did not know how to take medications	4	14.8
Total	27	100

Patient Satisfaction with the Discharge Process. Those patients who rated their satisfaction with the discharge planning process as a nine or ten was 59.2% or 16 out of 27 participants. The distribution of satisfaction scores ranged from a minimum score of two to a

maximum score of 10. The mean satisfaction score was 8.56 and a standard deviation of 1.93 as noted in Table 10.

Table 10

Patient Satisfaction with the Discharge Process (n=27)

Distribution of Satisfaction Scores	**Frequency**	**Percent**
2	1	3.7
6	3	11.1
7	2	7.4
8	5	18.5
9	3	11.1
10	13	48.1
Total	27	100

Patient Readiness for Discharge. 64 % of participants rated their readiness for discharge as a 9 or 10. This represented 16 out of 25 participants. The distribution of readiness scores ranged from a minimum of 2 to a maximum of 10. The mean readiness for discharge score was 8.36 with a standard deviation of 2.45. Results are displayed in Table 11.

Table 11

Patient Readiness for Discharge (n=25)

Distribution of Readiness Scores	Frequency	Percent
2	2	8
5	2	8
7	2	8
8	3	12
9	3	12
10	13	52
Total	25	100

30-day Readmission Rate. One participant was readmitted, and one participant visited the emergency department within 30 days of discharge. The 30-day all cause readmission rate was 3.3% based on 30 participants (Table 12).

Table 12

30-day Readmission Rate (n=30)

Admitted within 30 days of Discharge	Frequency	Percent
Yes	1	3.3
No	29	96.7
Total	30	100

Final evaluation demonstrated that the RED Toolkit intervention was helpful in improving patient satisfaction with the discharge process, readiness for discharge and knowledge

of self-management. Feedback from the discharge educators indicated that the workflow needs to be streamlined to reduce redundancies. Discharge educator responses indicated that there are resource barriers that needed to be addressed by the target organization such as lack of in house support for the orthopedic case manager to assist with the discharge planning process. The discharge educator comments also indicated a need to create an electronic after-hospital care plan.

Act. During the "act" phase of the PDSA cycle, a plan is developed to refine the change derived from what was learned from the pilot (AHRQ, 2013). The outcomes of the project will determine its future direction. The goal of the project is to use the RED Toolkit as a standard of care for all patients. Further rollout could include all patients on the orthopedic unit and the establishment of policies to coordinate and integrate RED components across organizational boundaries or specific populations. The act phase of the cycle will give the implementation team an opportunity to review the role of the discharge educator and determine if the RED components should be assigned to just one individual or be shared by multiple team members.

Dissemination of Best Practice

The last step of the EBPI model is the dissemination of best practice on a wider scale (Levin et al., 2010). Dissemination of results can occur through presentations at the local, state, and national levels. A project literature review poster was presented at the Promedica Nursing Research Day in Toledo, Ohio in the Fall of 2017 and at the Midwest Nursing Research Society in the Spring of 2018 in Cleveland, Ohio. Other opportunities include annual professional conferences such as Sigma Theta Tau and the Ohio Organization of Nurse Executives (OONE). Future plans include manuscript preparation and publishing of the doctoral project after graduation.

Discussion

The purpose of this Doctor of Nursing Practice (DNP) project was to determine among adult patients on an orthopedic unit (P) how does the use of the RED Toolkit (I) compared to current practice (C) affect staff RED Toolkit compliance rate, discharge time, patient knowledge for self-management, patient satisfaction with the discharge process, patient readiness for discharge, and 30-day readmission rate. The goal is to use the RED Toolkit as the standard of care for all patients to improve patient-centered outcomes.

Understanding and addressing barriers and facilitators is necessary for the implementation of the evidence-based practice change within the clinical environment. System change can be challenging. Barriers and facilitators can be present at the patient, clinician, and system level and involve knowledge and skills, beliefs, attitudes, social and organizational influences, organizational resources, and technical issues. Formulating approaches to maximize the facilitators and mitigate the barriers can assist in project implementation. Facilitators of the project included administrative support, the already established interdisciplinary discharge team, and the total hip and knee orthopedic process improvement team. Barriers to implementation of the DNP project included lack of knowledge about role expectations, lack of resources, concern about role overlap amongst team members related to discharge planning, resistance to change, and lack of knowledge needed to implement the change.

To overcome barriers Shortell et al., (1998) state the dimensions that contribute to the barrier must be addressed if quality improvement efforts are to be effective and sustained. The four interrelated dimensions of Shortell's framework are strategic, cultural, technical and structural. The strategic domain includes organizational strategy, vision, and budget (Shortell et al., 1998). The organization's norms, values, beliefs and behaviors are part of the cultural

dimension (Shortell et al., 1998). Information infrastructure and training are included in the organization's technical dimension (Shortell et al., 1998). The structural domain refers to the acquisition and dispersion of knowledge throughout the institution (Shortell et al, 1998).

Lack of resources, part of the strategic dimension, was a barrier to implementation of the evidence-based practice project. This included time constraints, staffing issues and competing priorities. To overcome this barrier, the project leader worked with the implementation team to identify change champions willing to move the pilot forward and discuss concerns. The staff expressed a desire to participate in the project but felt the lack of sufficient resources to complete job responsibilities hindered the ability to fully execute the RED components. The implementation team decided to use the lead nurses to create the after-hospital care plan and the orthopedic case manager to conduct the follow up phone calls.

Lack of knowledge regarding role expectations, concern regarding overlap of roles amongst team members, resistance to change, and commitment to EBP were cultural barriers that impeded the implementation process. Staff were given the opportunity to express their concerns regarding project implementation and role overlap and propose suggestions. The background of RED and the need to approach changes to practice based on evidence was discussed during the kick-off meeting. The use of project champions to reinforce the message that RED is not an addition to the current discharge process but a new way of discharging patients that requires an abandonment of the old process helped to mitigate this barrier. However, the inability to eliminate forms deemed to be duplicative impeded the process.

Difficulty accessing resource materials is a barrier in the implementation process in the technical domain (Solomon & Spross, 2011). One strategy to address this issue was to include Health Information Management (HIM) in the planning phase to determine how to use word

processing software to create an individualized AHCP. While creating the AHCP directly from the information system is optimal, no changes were able to be made to the current Electronic Medical Record (EMR) due to the adoption of a new EMR in 2019. RED training materials were available on the unit and provided to each discharge educator in the training session. The lack of full integration with the EMR added to the time needed by the discharge educators to manually enter information in the after-hospital care plan.

Lack of knowledge needed to implement the change falls under the structural dimension of the implementation process (Shortell et al, 1998). Education began during the Fall of 2017, when the doctoral student shared the landmark study by Jack et al, 2009 on the impact of the Re-Engineered Discharge process on rehospitalization with the CNO, unit director, orthopedic physician, and outcome manager. A qualitative study by El-Rafie, El-Nouman, Salam, Galal and El-Sebaie (2017) used a pre-test and post-test design to evaluate the knowledge of nursing staff on discharge best practices as a result of a Re-Engineering Discharge education program. A convenient sample of 24 nurses participated in the study at three randomly selected internal medicine units in Cairo University Hospitals. A questionnaire was completed by the nurses before and after the training. A statistically significant improvement ($p<0.001$) in the nurses' knowledge about readmission definition, antecedents and consequences, as well as common readmission diagnoses, the discharge process and nurses' role was noted. Education in the practice setting can improve provider knowledge to effect changes in practice. Stakeholder training also included background information on the use of the Re-Engineering Toolkit.

RED Toolkit Compliance

During project implementation one participant discharge occurred on the weekend where a staff member serving in the role of lead nurse had not received the RED Toolkit training.

Despite this, the staff nurse took the initiative to contact a co-worker to determine what needed to be completed for the patient as part of the project. While compliance with the RED Toolkit components was almost 90% three participants did not receive the AHCP because they left the unit prior to meeting with the lead nurse who was busy with other unit responsibilities. Jack et al. (2009) report that 306 (83%) left with an AHCP during their study. Participant-reported outcome data for this project was obtained from 26 of 30 (86.8%) compared to 615 of 738 (83%) (Jack et al., 2009). Gaps occurred in the completion of the follow up phone call within the required time frame due to limitations of the orthopedic case manager. This position reports to the orthopedic service and has out-patient as well as inpatient responsibilities. Additionally, there is no coverage in the absence of this individual unless for an extended period of time. These factors contributed to the 46.7% call rate within 72 hours. Recommendations to improve compliance in this area include establishing a champion over each RED component, prioritizing the inclusion of RED components in the discharge planning process or implementing the RED Toolkit in phases.

Discharge Time

The outcome measure regarding discharge within two hours of the written order or before 11 am did not meet the benchmark. Only three participants left the unit within two hours of the written discharge order and no patients left before 11 am. 50% of the patients left the unit six hours after the discharge order was written. One participant indicated there was a delay in discharge due to waiting for a consultant to visit. Another participant's discharge was delayed waiting for pharmacy to deliver home-going medications. One individual stated it would have been helpful to know the discharge time in advance in order to arrange for transportation. 22 orders were written before 9 am which indicates that the majority of discharge orders for this

population were written within a time frame to feasibly accomplish the goal. The problem of discharge time was identified in the Spring of 2017 and continues to challenge the unit, creating patient flow bottlenecks. Given that some post op patients return to the unit in some cases as late as 7 or 8 pm it may be necessary to re-evaluate this goal in order to ensure that therapy treatments and discharge instructions can be provided to the patient to help facilitate a successful transition to the next level of care. Clarification of the role of the clinical nurse in the discharge process may be helpful in addressing this issue (Gray et al., 2016; Wertheimer et al., 2014).

Patient Knowledge for Self-Management

This outcome consists of three factors: knowledge of diagnosis, symptoms to report and knowledge of how to correctly take medications. Although the target of 100% was not achieved the results indicate that 100% of the patients had some level of understanding of their diagnosis while 92.6% had full understanding of their diagnosis and reporting symptoms. Jack et al. (2009) reported that 198 (66%) of participants receiving the RED Toolkit intervention understood their main problem or diagnosis. The biggest area for improvement is to increase the patients' understanding of how to correctly take their medication. The 85.2% project outcome is less than the 89% achieved for medication knowledge in the RED Toolkit intervention group but closer to the usual care group at 83% (Jack et al., 2009). In the follow up phone call two participants indicated that they did not know how to take or wish they had more instruction on how to take Lovenox.

Patient Satisfaction with the Discharge Process

The target unit showed improvement in patient satisfaction with the discharge process from 33% to 59.2%. This reflects those participants who rated their satisfaction nine or above.

Of note is that the mean satisfaction score was 8.56±1.93. Satisfaction is a key factor in the value-based purchasing score. Noted dissatisfiers from two project participants included having to wait to be seen by other departments prior to discharge. This outcome supports the need to secure just in time patient satisfaction information in order to be responsive to the patients' concerns.

Patient Readiness for Discharge

A noted improvement occurred in patient readiness for discharge from 2% to 64%. This is indicative of those participants who rated their readiness nine or above. This outcome is consistent with the findings in Jack et al., 2009 where self-reported preparedness of the RED Toolkit intervention group was 65%. Two participants indicated they could not assign a number. Participant comments from one individual stated that although they felt medically ready for discharge, they did not feel emotionally ready. Two participants wished they could have stayed one more day. Pre-mature discharge is a factor strongly associated with readmission (Alper et al. 2014). Although length of stay was not analyzed for this project, a one to two-day hospital stay is common for a total hip or knee replacement without complications. Two other participants indicated they could have benefited from more therapy. The need for more instructions on activity level was expressed by two patients. Further exploration on the delivery of therapy services might be warranted to improve this variable.

30-day Readmission Rate

The outcome measure regarding 30-day readmission rate did not meet the benchmark of 3% but was close to the target goal. One participant (3.3%) was readmitted out of 30. This could be the result of a small sample size. Many admissions are avoidable. A thorough assessment of

the reasons for readmission need to be examined and discussed in an interdisciplinary environment in order to address any issues.

Kotter's Change Theory and Evidence-Based Practice

The project results showed an increase in patient knowledge for self-management, patient satisfaction and readiness for discharge. These indicators are important as organizations seek to benchmark, measure and continuously improve the discharge process (NQF, 2010). Staff compliance with the RED Toolkit did not meet the goal of 100% but was consistent with the findings in Jack et al., 2009 and demonstrated the staff's willingness to re-examine work flow processes. Although discharge time and 30-day readmission rate did not meet the desired benchmarks, discrepancies were accounted for and discussed previously. While the introduction of EBP was not totally embraced, the staff demonstrated a willingness to engage in the EBPI process with the hope of improving the discharge planning process. Change is not easy but clinical practice cannot be improved without attempting to integrate the best evidence at the bedside.

Strengths and Limitations

The strengths of the project included an already present interdisciplinary discharge planning team and strong nursing leadership who believed in the value of evidence-based practice. The use of the EBPI model to guide project implementation also served as a strength for the project. By incorporating a quality improvement frame work the EBPI model provided a natural fit for the scope of the project.

Limitations of the project included a small sample size, the use of only one unit, and one urban hospital. Because of the exclusion of patients from other diagnostic groups the results may

not be generalizable to other patient groups. Since the intervention was bundled, the effects of each intervention on the results are not able to be determined. Other limitations included the lack of information technology capability to create the toolkit forms electronically and reliance on participant self-report for outcomes that could not be obtained from the electronic medical record.

Conclusion

Hospitalization and the follow up care that is required can often leave patients and caregivers feeling overwhelmed. The costs of poorly coordinated care transitions impact length of stay, emergency department visits, hospital readmissions, patient experience, and care needs after discharge.

The critical appraisal of the evidence indicates that discharge planning should be patient-partnered, involving the patient and family caregivers. A successful discharge transition includes multiple concurrent strategies rather than a single element. The purpose of the project was to determine if among adult patients on an orthopedic unit undergoing a hip or knee joint replacement or revision (P) how does the use of the RED Toolkit (I), compared to current practice (C), affect staff RED compliance, discharge time, patient knowledge for self-management, patient satisfaction, patient readiness for discharge and 30-day readmission rate(O). Results indicated that staff achieved a RED Toolkit compliance rate of 86.8%, improved patient knowledge for self-management (85.2-92.6 %), improved patient satisfaction with the discharge process (33% to 59.2%), and improved patient readiness for discharge (2% to 64%) and a reduction in the 30-day readmission rate (6% to 3.3%), however discharge time did not meet the benchmark. Final and process evaluations, including project outcome measures and feedback from the discharge educators, support the use of the RED Toolkit with resolution of

implementation issues and consideration of additional resources.

Future Recommendations

The case manager is in an ideal position to function in the role of discharge educator. This warrants additional resources. Consideration could be given to assigning a champion to each RED component or prioritizing the components and rolling them out in phases. Future recommendations garnered from the project include the use of change agents for quality improvement projects or other change initiatives. Creating a coalition and utilizing key stakeholders are important denominators in advancing change. Change requires resources, communication and creativity. Additional recommendations include incorporating evidence-based practice process in staff orientation and developing unit-based practice councils to address practice issues. Integration of the AHCP into the electronic medical record is a necessary step to full integration of RED as well as the review of and elimination of redundant forms. Comments from patients participating in the project discussed the need for more education on the use of Lovenox prior to discharge. The presence of an orthopedic provider and consistent social worker would also facilitate the work of the discharge planning team.

DNP Essentials

The DNP Essentials serve as a guiding framework for advanced nursing practice in the design and implementation of innovative processes to improve clinical outcomes that are based on the best evidence. The *Essentials for Doctoral Education of Advanced Nursing Practice* were established in 2006 by the American Association of Colleges of Nursing (AACN) and outline the competencies for the DNP. The DNP Essentials were interwoven throughout this project.

Scientific Underpinnings for Practice is the first DNP Essential (AACN, 2006). Analytical and organizational science was used to develop and evaluate the DNP project. This was evident in the advancement of the quality improvement team and communication with all stakeholders throughout the project. Levin's framework (2010) and Kotter's change theory (1996) were also used to develop and evaluate the project.

Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking (AACN, 2006) calls for the DNP to focus on the needs of the target population and develop new methods of care delivery cognizant of the organization's, political, cultural and economic environment. Inherent to this quality improvement project was the ability to assess the organization, identify systems issues, address practice problems, collaborate with team members and facilitate changes in practice delivery. A knowledge of quality improvement strategies was of value.

Clinical Scholarship and Analytical Methods for Evidence-Based Practice, the third DNP Essential (AACN, 2006) required the project leader to translate the knowledge of the RED Toolkit to the practice environment and evaluate its effectiveness. The project further met this essential through an extensive review of the literature and utilization of evidence-based practice to develop the project. Dissemination of finding from evidence-based practice is also a part of the essential. The synthesis of the literature review was disseminated at Promedica Research Day in the Fall of 2017 and at MNRS in the Spring of 2018.

DNP Essential IV is Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care (AACN, 2006). The use of information systems /technology was important to this project in order to imbed the AHCP into the EMR.

However, due to the organization's plan to launch a new EMR in the next year, no changes could be made. Therefore, technology became a limiting factor for this project.

Essential V, Health Care Policy for Advocacy in Health Care (AACN, 2006) calls upon the DNP to examine health care policy at the local, state, national and international level. The project brought to light the importance of examining the discharge planning process on the unit and potential changes to the policy to improve the transition of care.

Interprofessional Collaboration for Improving Patient and Population Health Outcomes is the sixth DNP Essential (AACN, 2006). This essential requires the DNP to work effectively with interprofessional teams in order to provide high quality, safe, effective patient-centered care. The project met this essential by working with the interdisciplinary discharge planning team to review the discharge process, identify strengths, weaknesses, opportunities and threats to improvement. The EBPI model and PDSA cycle were used to lead the interdisciplinary team through the quality improvement process.

DNP Essential VII is Clinical Prevention and Population Health for Improving the Nation's Health. Gaps in the delivery of discharge planning services was analyzed to determine the best intervention for the orthopedic population included in the project. The EBPI model was used to evaluate the discharge planning process utilizing the RED Toolkit as a strategy to assist in the transition of care.

The last DNP Essential is Advanced Nursing Practice. After completing a comprehensive assessment of the problem an intervention was designed, implemented and evaluated. Information from nursing science as well as the psychosocial, behavioral, economic and sociopolitical domains was utilized. The project required creating relationships with the organization's nursing administration, unit staff, and interdisciplinary team members. Education

was provided to key stakeholders on EBP and the RED Toolkit. Ongoing support was provided to the team to encourage them to move forward with implementing the practice change. Systems- thinking and analytical skills were utilized to design, deliver and evaluate the use of the RED Toolkit and its impact on discharge planning outcomes.

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Appendix A

Agency Support Letter

Use of the Re-Engineered Discharge (RED) Toolkit on patients undergoing a Hip or Knee Joint Replacement or Revision: An Evidence Based Practice Improvement Project

The goal of the project is to have the RED Toolkit as a standard of care for all patients to improve the discharge process. The purpose of the proposed evidence-based improvement project is to evaluate the use of a discharge planning process for hip and knee cases on an inpatient orthopedic unit. The outcome indicators, or measures of achievement, are decreased 30-day readmission rate, increased patient satisfaction, staff compliance with RED Toolkit, increased patient readiness for discharge, and patient knowledge for self-management (AHRQ, 2017).

Discharge planning is an important are of concern for the institution. I am willing to support the implementation of this project.

Monecca Smith, MSN, RN

Chief Nursing Office, Director of Nursing

The University of Toledo Medical Center

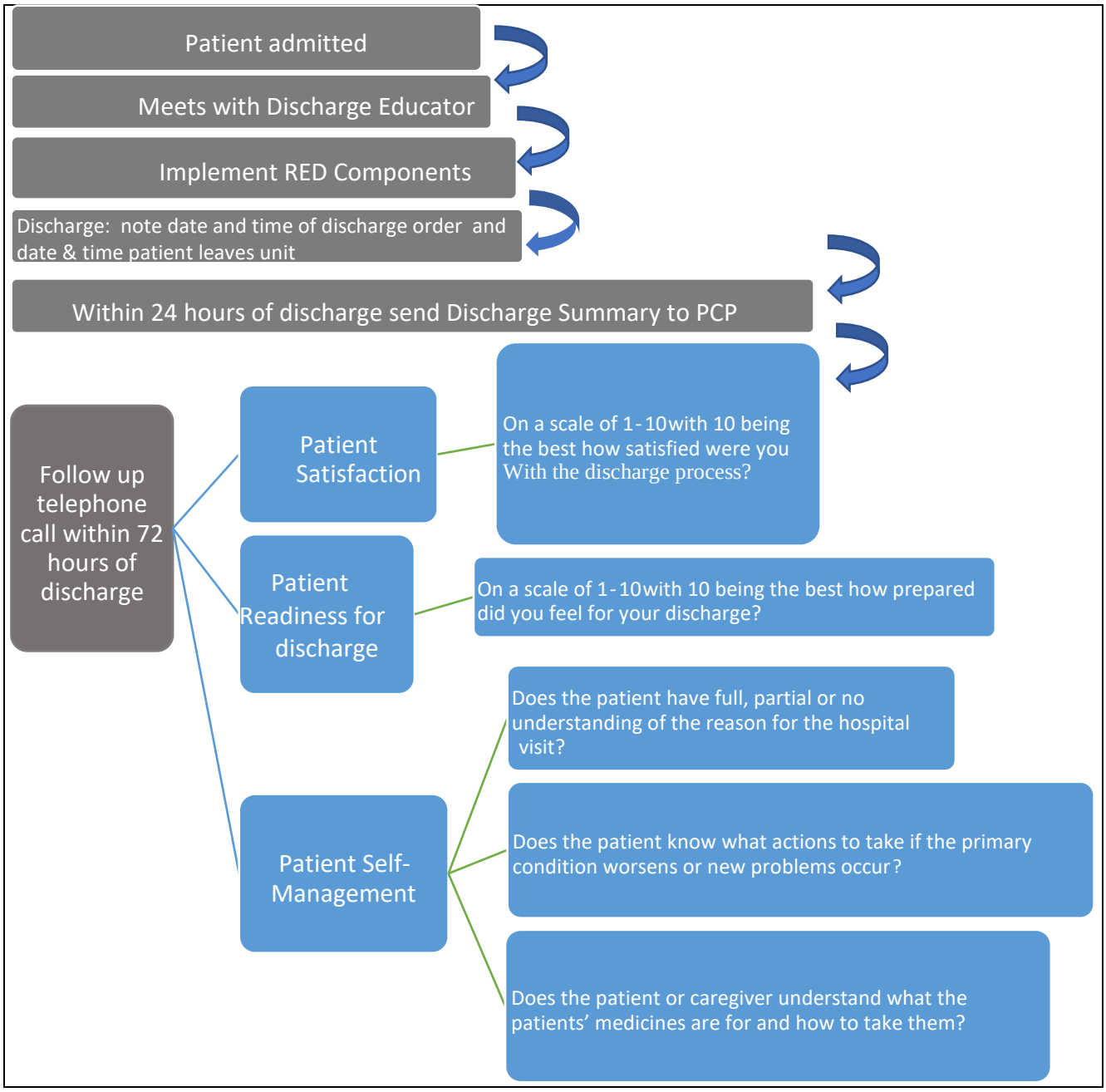
Appendix B

RED Toolkit Guideline

Project Title: USE OF THE RE-ENGINEERED DISCHARGE (RED) TOOLKIT ON PATIENTS UNDERGOING A HIP OR KNEE JOINT REPLACEMENT OR REVISION

Purpose: To evaluate the use of a discharge planning process for hip and knee cases on an inpatient orthopedic unit

Procedure:



RED Components Checklist

Patient name: _____ **Age: _____ Gender: Male / Female** **Payer Type: Private / Medicaid / Medicare** **ED: Less than HS / Some HS / HS grad or GED / Some college / 4 yr college grad or higher** **Caregiver(s) name(s): _____** **Relationship to patient: _____** **Date discharge order written:_____ Time discharge order written:_____** **Discharge date: _____ Discharge time off unit:_____** **Principal diagnosis: _____** **Interpreter needed? Y N Language/Dialect:_____**	**Date completed and initials**
1. Ascertain need for and obtain language assistance	
2. Make appointments for follow up care (medical appointments and post discharge tests/labs)	
3. Plan for follow up of results from lab tests or labs that are pending at time of discharge.	
4. Organize post discharge outpatient services and medical equipment.	
5. Identify the correct medicines and plan for patient to obtain them.	
6. Reconcile the discharge plan with national guidelines	
7. Teach a written discharge plan the patient can understand	
8. Educate the patient about his or her diagnosis.	
9. Review with the patient what to do if a problem arises.	
10. Assess the degree of the patient's understanding of the discharge plan.	
11. Expedite transmission of the discharge summary to clinicians accepting care of the patient within 24 hours of discharge	
Signature:	**Date:**

Follow up phone call Record

Prior to phone call:

Review:

Health History

Medicine lists for consistency

Medicine list for appropriate dosing, drug-drug and drug-food interactions, and major side effects

Contact sheet

Discharge Educator notes

Discharge summary and AHCP

Call Completed: Y N

With whom (Patient, caregiver, both): _____

Number of hours between discharge and phone call: _____

Consultations (if any) made prior to phone call: ○ None ○ Called MD ○ Called DE

○ Called outpatient pharmacy
○ Other: _____

If any consultation, note to whom you spoke, regarding what, and with what outcome:

_____

Self - Management:

1) **Ask the patient about his or her diagnosis**: ○ Patient had full understanding ○ Patient had partial understanding ○ Patient had no understanding
2) **Ask the patient what symptoms he/she is to watch out for or things to do for their condition** ○ Patient CORRECTLY reported symptoms to watch out for or things to do for their condition
    - ○ Patient DID NOT know what symptoms to watch out for or things to do for their condition

3) **Ask the patient how they are taking their medicines**
   - o Patient CORRECTLY reported how to take their medicines
   - o Patient DID NOT know how to take their medicines

If primary condition has worsened:

What, if any, actions had the patient taken?

- o Returned to see his/her clinician (name): _____
- o Called/contacted his/her clinician (name): _____
- o Gone to the ER/urgent care (specific): _____
- o Gone to another hospital/MD (name): _____
- o Spoken with visiting nurse (name): _____
- o Other: _____
- o What, if any, recommendations, teaching or interventions did you provide?

  _____

If new problem since discharge:

Had the patient:

- o Contacted or seen clinician? (name): _____
- o Gone to the ER/urgent care? (specify): _____
- o Gone to another hospital/MD?: _____
- o Spoken with visiting nurse? (name): _____
- o Other?: _____

Following the conversation about the current state of the patient's medical status:

What recommendations did you make?

- o Advised to call clinician (name): _____
- o Advised to go to the ED
- o Advised to call DE (name): _____
- o Advised to call specialist physician (name): _____
- o Other: _____

What follow up actions did you take?

- o Called clinician and called patient/caregiver back
- o Called DE and call patient/caregiver back
- o Other:

Patient Satisfaction with Discharge:

Ask the patient:

On a scale of 1 to 10 with 10 being the best, how satisfied were you with the discharge process?

_____

Patient Readiness for Discharge:

Ask the patient:

On a scale of 1 to 10 with 10 being the best, how ready did you feel for discharge?

_____

_____

Phone Call Attempts

Patient/Proxy

Phone Call #1:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #2:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #3:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #4:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:

Alternate Contact 1

Phone Call #1:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #2:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #3:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #4:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:

Alternate Contact 2

Phone Call #1:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #2:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #3:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:
Phone Call #4:	Date & Time:	Reached: Yes/No If No (circle one): ans. machine/no answer/ not home/declined/busy/rescheduled/other:

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30-day readmission: _____ Yes Date of readmission:_____

_____No