# Effects of a Palliative Care Trigger Assessment on Patient Outcomes for Patients Admitted in the Medical Intensive Care Unit

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## Abstract

**Purpose of Project:** The purpose of the project is to evaluate the effects of a palliative care (PC) trigger assessment on patient outcomes in the intensive care unit (ICU). The first aim is to address the late or absent use of PC services through a trigger assessment. The secondary aim is to increase comfort of nurses regarding PC matters, such as identification of need, assessment of patients, and discussion of PC.

**Methodology:** Retrospective and prospective chart reviews were used to study the effects of a trigger assessment on length of stay, time to PC intervention, and resuscitation status. Additionally, pre and post intervention surveys were used to study the effects of a trigger assessment on nurse comfort levels. Participants assigned scores based on diagnoses, situational modifiers, and a surprise question.

**Results:** 28 ICU nurses and 173 (100 at retrospective and 73 prospective) chart reviews were included in the study. Results found a 0.5 day increase to ICU length of stay compared to the usual care group. Overall, it improved on the other measured outcomes such as time to PC intervention, conversion of code status, and nurse comfort levels. It also found that code status changes occurred more frequently and quicker than in the baseline group.

**Implications for Practice:** The project, if adopted as usual practice, could improve on increasing PC services use and preventing aggressive expensive care at the end-of-life. Additionally, the project can improve on nurse involvement in patient's PC matters.

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## Introduction

Comprehensive care, as defined by the American Cancer Society (2020), is an approach to care that provides for the patient's needs and desires including the medical and physical. Using services outside of curative medicine provides a multidisciplinary approach, and through collaboration, providers better understand and treat the patients' needs and goals. Palliative care (PC) optimizes the care for the patient by aligning patient preferences and goals with the medical and surgical care. PC focuses care through symptom management, clear and sensitive communication, alignment of care with patient preferences, family support, and continuity throughout all levels of care (Nelson et al., 2013).

PC involvement is associated with better quality ratings at end-of-life processes, that 14-20% of intensive care unit (ICU) patients meet the triggers for PC consultation, and that a proactive PC specialist on ICU rounds correlates with earlier ICU family meetings and shorter hospital length of stays (Mercadante et al., 2018). Research discovered that patients who need PC consultations receive it too late or never at all (Chai, 2017). PC is an afterthought when all curative therapies have been exhausted or when there are issues with the family. When a patient becomes critically ill, the experience for both the patient and the family is likely unpleasant. Care then becomes important that it is comprehensive, goal-directed, and patient-centered.

All patients admitted to the ICU should receive a PC consultation to help direct the care of the patient. A trigger assessment at admission can address this. Trigger assessments are assessments that reflex a consultation to a specialty, for example, when a Braden Scale, a scale that assesses pressure injury risk, deems a patient high risk for pressure injury, a reflex wound care consultation order is entered via the electronic medical record (EMR). Trigger assessment may also reflex to an intervention by a specialist. Similarly, on admission to the ICU, nurses

could complete a PC trigger assessment. Depending on the patient's demographics, clinical condition, comorbidities, and prognosis, the assessment will trigger a PC consultation or intervention.

This proposal describes the benefits of a project that uses a PC trigger assessment to increase PC consultation or intervention, conversion of full code status to do not resuscitate (DNR), do not intubated (DNI) or allow natural death (AND), and decrease length of stay.

## Background

PC services are associated with improvements in the quality of life, symptom burden, advance care planning, patient satisfaction, caregiver satisfaction, and lower use of healthcare resources (Kavalieratos et al., 2016). PC, as defined by the World Health Organization (WHO) (2019), is a sub-specialty that improves the quality of life of patients and their families facing problems with advanced diseases. WHO, in 2018, found that 40 million people are in need of PC, and of those, 78% are from low to middle-income countries. Only 14 percent of people who need PC services receive it worldwide. WHO listed PC medicine as an essential medicine for adults and children. WHO continues to strengthen access to PC through different mandates and strategies around the world. One example of WHO's response is a collaboration with United Children's Fund (UNICEF) to increase PC access to children.

The Center to Advance Palliative Care (CAPC) (2019) reported several key findings regarding access to PC services in the United States. In 2015, a state-by-state report card reported that PC services depended on geography, hospital size, and tax status. However, CAPC reports that three quarters of the states have an A or B rating; those with an A rating have over 80% of the state's hospitals with a PC team, signifying an increase from 3 states in 2008 to 21 states in 2019. CAPC states that despite the increase, there is still a gap in access. CAPC

encourages lawmakers to enact policy as it relates to the PC workforce, payment, quality, standards, and research, clinician skills, and public and clinical awareness.

In August of 2019, New Jersey governor, Phil Murphy, signed a bill into law enacting a state advisory council on PC. The goal of the council is to create a PC access to establish a system that identifies those in need of PC and provides information on PC services (American Cancer Society, 2019). The advisory council released their report and recommendations and found that in New Jersey patients at the end of their life are treated more aggressively than any other state. The council found that 62% of deaths occurred in a facility rather than at home, while most patients report a desire to die at home. The council wishes that their recommendations for PC and end-of-life care address this and other gaps in PC and end-of-life medicine (New Jersey Governor's Advisory Council on End-of-life Care, n.d.).

## Significance

Because PC originated in end-of-life care in the 1960s, PC in the ICU is not a foreign phenomenon (Seaman et al., 2016). With the percentage of patients that die in the ICU averaging 10 to 29 % among the 5 million admitted annually in the United States, PC is an important specialty needed in the ICU (Society of Critical Care Medicine [SCCM], n.d.a). ICU care in the United States is the highest among use compared to other countries. The ease of access to ICU care increases its use, regardless of those patients at the end of their life or of a patient's prognosis (Angus & Truog, 2016). Because ICU mortality is high, those admitted to the ICU must receive PC consultations earlier rather than later (Mercadante et al., 2018). When PC consultation and intervention occur sooner in the patient's hospital stay, transition to DNR and DNI increase and there is reduction in ICU and post-ICU resource expenditure (Ma et al., 2019).

ICU care is an aggressive use of invasive treatment to prevent death in acute critically ill patients (Truog et al., 2008). PC offers an interdisciplinary approach to care that is focused on symptom management, assessment of patient values and preferences, alignment of patient preferences with goals of care, multi-modal support (i.e. psychological and spiritual), communication of prognosis and treatment options for patients with life-threatening illness and their families (Seaman et al., 2016). End-of-life care focuses on those actively dying and is synonymous with hospice care. At its core ICU, PC, and end-of-life care goals are similar. They share the goal of saving a life or prolonging life, achieved through the alleviation of suffering, improving quality of life, and providing a "good death" (Mercadante et al., 2018; Truog et al., 2008). Symptom management and discussion of goals of care in the context of the patient's prognosis and preference should be a part of the ICU care regimen (Mercadante et al., 2018)

In a large urban academic medical center, that primarily serves black middle to lower socioeconomic communities, a study revealed that Medicare expenditures and interventions are different at end-of-life when compared to the usual treatment of racial and ethnic groups. Black and Hispanics decedents have substantially higher costs compared to white decedents at the end-of-life because of receiving more life-sustaining interventions (Hanchate et al., 2009). More than a quarter of Medicare dollars are spent on ICU care at the end of life. Coupled with the fact that most patients at the end of life are more likely to receive ICU care, healthcare at this stage becomes an expensive treatment (Angus & Truog, 2016). PC services can bridge the gap to decrease expenditure at the end-of-life in these groups.

## Needs Assessment

A strengths, weakness, opportunities, and threats (SWOT) analysis was conducted to assess the need for a palliative care trigger assessment at a large urban academic medical center's ICU.

### Strengths

In this facility, there is buy-in from all levels of leadership to improve the care of the patient. The nursing education department continues to implement the Society of Critical Care Medicine's (SCCM) Assess, prevent, and manage pain, both spontaneous awakening trials and spontaneous breathing trials, choice of analgesia and sedation, delirium: assess, prevent, and manage, early mobility and exercise, and family engagement and empowerment (ABCEDF) bundle in the ICU. Family engagement and empowerment (F) is family and patient-centered care characterized by patients and families as informed, active in decision-making, self-managing, provided for in both physical and emotional needs, and maintains a clear understanding of the illness and cultural beliefs. This project aligns with the aims and goals of the hospital's ABCDEF bundle initiative (SCCM, n.d.b).

The facility has a small but established PC team. The pulmonary critical care service uses the team and understands their value in terms of the patient's care. Many times, in the medical ICU, the need of PC consultation is made by the provider team. Next day family meetings occur, which can ease some burdens for the medical team and the families.

A part of the nursing admission assessment, an option is available to refer the patient to several disciplines. A nurse has the ability to make a referral for PC services, however, there is no formal assessment process, and the decision is subjective, limiting its use.

**Weaknesses**

Limitations of the PC specialist include staffing and hours. PC specialist services can only be conducted during business hours and is subject to availability. Many other disciplines have a formal process to assess the need for services. However, there is not a formal assessment for PC consultation. Because there is no formal assessment, PC consultations are subject to the opinion of the medical provider team.

As an academic medical center, it values teaching. Teaching presents several issues in the ICU. The medical team comprises of residents, fellows, and attendings, which rotate every week affecting the establishment and continuation of a relationship with the patient and the family. The lack of consistency in the medical team can negatively affect the communication of information, care of the patient, and rapport with the family.

**Opportunities**

There are opportunities in the weaknesses to improve. For instance, with a small PC team, PC meetings can be conducted by the medical team. This enables the medical team to learn and understand the dynamics of holistic patient care. By allowing the medical team to conduct the meetings, residents will communicate better with the family and understand the patient's preferences. Because it is an academic facility, this will reinforce residents' acceptance and use of PC services, while they learn to integrate PC objectives into their own practices.

In addition, the project will provide a formal assessment for the nurses to use. With a formal assessment, the EMR can trigger a PC consultation. A formal assessment provides an objective reason for a referral rather than a subjective opinion. This project can empower the nurses as champions and advocates for the patient and their families. Using the assessment can increase PC use, which no longer makes it a provider's opinion of need.

Drawing from the facility's strengths, the project can further enhance their initiative in the ICU. The project aligns with SCCM's ABCDEF bundle and the hospitals initiative to improve quality of care. Approaching the F in the bundle with a multi-disciplinary strategy can ease some stress from the medical team and nursing team.

**Threats**

A lack of formal assessment can lead to missed opportunities to alert the provider of the need for consultation. This can potentially delay, lengthen, or malign the care of the patient and their preferences. Because it is a learning hospital, the different attitudes, cultural, and spiritual beliefs of the providers can negatively affect the patient's care as it relates to PC and end-of-life care.

Furthermore, the limited staffing and hours of the PC specialists can limit the implementation of the project. If PC intervention is needed on non-business hours, it would be conducted by non-PC trained providers. Because there are not trained or skilled in PC interventions this could negatively affect the projects measured outcomes.

## Problem Statement

PC in the ICU began with end-of-life care. As a result, PC consultations were called after life-prolonging interventions occurred, the care of the patient was deemed medically futile, or if all options have been exhausted. It is now understood that PC earlier in the illness trajectory, even in an ICU setting, has added benefit in goal clarification, assistance in complex medical decision making, and shorter ICU stay (Kavalieratos et al., 2016; Norton et al., 2007; Zalenski et al., 2017). It is found that PC consultations are received too late in their hospital course (Zalenski et al., 2017). In 2010, approximately 2.5 million deaths occurred in the United States, and about one-third of these deaths occurred in the hospital. According to the National Hospital Discharge

Survey (NHDS), most Americans prefer to die at home. (Hall et al., 2017). Healthcare providers need to work to align this desire of dying at home with their practice.

In an urban academic medical center, PC services follow the trend of late or absent PC consultations. Because of late or absent PC consultations length of stays are increased, there is lack of goal clarification, and delayed decision making occurs. A trigger assessment on advance directives are currently in use at this facility. The assessment simply asks if the patient would like information on an advance directive but does not address need. If the patient attests to more information, then a PC specialist will see the patient and discuss advance directives with them. Though this uses PC specialists, it does not address the patient's need for PC services. The purpose of the project is to address the late or absent use of PC services through a PC trigger assessment in the ICU and its effect on length stay, time to PC intervention, and resuscitation status.

## Clinical Question

In patients admitted to the Medical ICU, what are the effects of a PC trigger assessment on patient outcomes such as length of stay, time to PC intervention, and conversion of full code to do not resuscitate status, compared to those who receive palliative care interventions later in their stay within 2 months?

## Aims and Objectives

The overall aim of the project is to address late or absent PC interventions through a trigger assessment in the medical ICU of a large academic urban hospital and to evaluate the outcomes related to a trigger assessment as it relates to length of stay, time to PC intervention, and conversion of full code to DNR, DNI, and AND. A secondary aim is to increase comfort of

nurses' assessment and addressing a patient's PC needs. This can be achieved through the following objectives:

- Prior to the implementation of the project, a retrospective chart review measured baseline data on patients admitted within a 6-week time frame, and assessed their length of stays, time to PC intervention, and resuscitation status.
- Prior to the implementation of the project, educate the nurses regarding the PC and ICU and the screening tool used to trigger PC interventions for one week, in February 2021.
- Evaluate nurses' comfort level regarding PC issues using a survey prior to the intervention arm of the project.
- Use a PC trigger assessment for all patients admitted in the medical ICU in a 6-week period, February 14, 2021 to March 27, 2021.
- Perform a prospective chart review to measure length of stay, time to PC intervention, change in resuscitation status of all patients admitted to medical ICU during the implementation of the project.
- Complete data collection within 1 month after the end of the implementation.
- Compare and analyze baseline data with the measured data of the project after implementation,
- Evaluate the projects overall process, sustainability, successes and failures using an evaluation tool.

## Review of Literature

A growing body of knowledge and literature continue to support PC and its use in patients with advanced stage illnesses (Seaman et al., 2016). The evidence continues to grow and

support PC in the ICU (Campbell & Guzmam, 2003; Hsu-Kim et al., 2015; Norton et al., 2007). Further, the evidence is logical that early PC consultation and intervention provide better outcomes for the patient (Ma et al., 2017; Mun et al, 2016; Zalenski et al, 2017). To review the body of evidence, a literature review was conducted. First, a general search, without restrictions was performed using the PubMed database with four principal term (1) PC, (2) ICU, (3) screening/trigger, and (4) outcomes. A medical subject heading (MeSH) search was first used to identify terms related to the key terms. Table 1 in Appendix A outlines the MeSH terms identified for the principal terms. The initial search yielded $N$ = 942 articles. After refining the search, removing articles greater than 5 years, duplicates, foreign language, and unavailability of a full text, it yielded $n$ = 468 articles.

Review of the abstracts for inclusion encompassed the principal themes and exclusion of articles that did not meet certain criteria. Exclusion criteria excluded articles regarding screening tools not related to PC, used for managing critical care illnesses, and relating to end-of-life care without screening. Review of the abstracts yielded $n$ = 79 articles. A full review of the 79 articles yielded $n$ = 27 articles. The articles for final use comprised of an article's relation to the clinical question, effect of timing of referrals, and similarities to the projects design. The final review yielded $n$ = 10 articles. Figure 1 in Appendix A is a PRISMA flow diagram of the literature search.

The articles were divided into three subcategories: articles that (1) addressed PC screening or consultation in the ICU, (2) matched this project design, (3) timing of PC consultation in a non-ICU setting, and (4) integration models of PC. The last selection of articles generated a variety of studies, representing several parts of the hierarchy of evidence. Refer to Appendix B: Table of evidence for a summary of the articles in this literature review.

**PC Screening and Consultation in the ICU**

Of all the articles in the literature review, the three in this subcategory represent the impact of PC consultation in the ICU. Ma et al. (2019) addressed early PC consultation in a randomized crossover trial. A total of 97 intervention patients received early PC consultations (within 48 hours of medical ICU admission). PC consultations were considered a chart review, meeting with patient and healthcare proxies, multidisciplinary planning on addressing patient and family needs, family meetings, and goals of care discussions. Conversion of full code status was the primary outcome measure and yielded a statistically significant difference in the intervention group. Change in code status occurred quicker and more often when compared to the usual care group. Length of stay for both ICU and hospital, revealed no difference when compared to the usual care group. This outcome is different for Zalenski et al. (2017) and Kyeremanteng et al. (2018). They discovered similar statistically significant decreased length of stays with early PC consultations. The research defines early PC consultation and assign trigger criteria by different means. For Zalenski et al. (2017), early consultations ranged from zero to seven days. There is no discussion of procedure in terms of what constituted a PC consultation such as in Ma et al. (2019). Kyeremanteng et al. (2018) reviewed several studies and found trigger or screening criteria are different in every study. Further Kyeremanteng et al. (2018) found that PC consultations impact on length of stays coincides with the body of evidence and with the research by Zalenski et al.

**Pilot Programs with Similar Design**

The following research has similar methodology to this project. Therefore, these research articles were included in the literature review. Both research by Jones and Bernstein (2017) and Jenko et al. (2015) piloted a PC screening program in an ICU. Their project designs are similar

to the design of this project. In Jones and Bernstein (2017), the pilot program used the electronic medical record to create a best practice advisory for the nurses and physicians to order a PC referral. If patients met certain criteria, the best practice advisory would alert the nurses and doctors with a pop-up alert to order, defer, or ignore. This is similar to the design of the project as a trigger assessment for burses to complete for doctors to order a PC intervention. In Jones and Bernstein (2017), prior to the pilot, only 27 PC consults occurred for the year. In the pilot program's first month, 20 patients were identified by the triggers, 11 orders for PC referrals were made, and four patients received PC referrals outside of the trigger criteria. A total of 15 PC referrals were received in the first month. A projected potential of 180 consults annually is a 566% increase in PC consultations. The research by Jones and Bernstein (2017), shows that PC trigger assessment increases PC consultations, potentially increasing PC interventions. Jenko et al. (2015) measured nursing outcomes such as knowledge and comfort of PC use and screening tools. The only patient-related outcomes measured was rate of PC referrals. The pilot used a prognostic screening tool which increased PC referrals by 110%.

The quality of these studies is low; however, lessons are learned from the limitations and failures of these studies. Lessons to be learned from these studies include comparison of data pre- and post-intervention, allowing for adequate time for intervention, and having an adequate sample size. Jones and Bernstein (2017) only measures one outcome and does not do a pre- and post- intervention comparison. As a pilot program, the authors only studied the intervention and its efficiency for PC consultations. The program ran only a short time and needed baseline data, such as demographics, medical conditions, and time from admission to referral order. The study referred to five patients who met criteria for PC consultation but was never ordered. Electronic medical record alert fatigue may account for the five patients not consulted. Alarm or alert

fatigue may need to be addressed in future research of electronic trigger assessments. In Jenko et al. (2015) further evaluation of patient-related outcomes is needed. The research only study one patient-related outcomes and comfort levels of the ICU nurses. The small sample size affects transferability. If the study extended to all the ICUs, it may contribute to more statistically significant data. Applying these improvements to the proposal's project may strengthen its aims.

**Early PC Consultations in a Non-ICU Setting**

This category assessed the timing of PC consultations in a non-ICU. All three studies, Grudzen et al. (2016), Wilson et al. (2020), and Robbins et al (2019), demonstrate that early PC consultation have favorable patient related outcomes. The definition of early is different in every study. For Robbins et al. (2019), early was defined as greater than 90 days before the death. The two others, Grudzen et al. (2016) and Wilson et al. (2020), studied referrals and consultations in the emergency department. Therefore, early for these studies occurred in the emergency room, where most patients first come to the hospital.

Robbins et al. (2019) and Wilson et al. (2020) discovered that early PC consultation when compared to later or inpatient consultation was associated with lower health care use such as ICU care and shorter hospitalizations. Additionally, both studies also found that early PC consultation was associated with increased use of hospice care. Outside of the ICU, PC consultations have similar outcomes Use of trigger-based assessments in the emergency department provide immediate assessment of PC need (Gruzden et al., 2016; Wilson et al., 2020). Gruzden et al. (2016) studied emergency department-initiated PC care and found a statistically significant higher quality of life in the intervention patients. The intervention group had an increase of 5.91 points on their testing at weak 12 than those on the usual care path (Wilcoxon rank test $P = .03$).

### Integration Models of PC

The last category identified integration models of PC. Rather than using consultation model of PC services, integration models of PC incorporate PC services in the usual care of the patient. Mun et al. (2016) found a trend in decreased length of stay in the hospital and earlier establishment of goals of care when PC services were integrated at the establishment of care. Vanbutsele et al. (2018) found an increase in patient satisfaction and quality of life when PC was integrated in the care. Because PC is integrated in the care, interventions are immediate and there is no question of when consultations occur. Integration models are different than consultation models because PC interventions are not on demand but rather woven in the daily care of the patient. However, there are limitations to integration models, for example increased staffing and a dedicated PC specialist are needed aside from the usual care of the patient.

### Summary

The articles in the first three categories all used consultation models. They had a similar effect on outcomes as the integration models. All research in this literature found improvement in patient-related outcomes such as length of stay, quality of life, and increase in PC services. This literature review further solidifies the understanding that earlier PC consultation or intervention are associated with better patient outcomes such as length of stay, conversion of full code status, time to PC consultation or intervention, and improvement of quality of life (Grudzen et al., 2016; Jenko et al., 2015; Jones & Bernstein, 2017; Kyeremanteng et al., 2018; Ma et al., 2019; Robbins et al., 2019; Wilson et al., 2020; Zalenski et al., 2017). Integration models of PC are the earliest in establishment of PC services in patient care, as the interventions are immediate, because PC services are present and active at the beginning of the patient's care (Mun et al., 2016; Vanbutsele et al., 2018). Emergency room-initiated PC screening and

consultations have similar effects to ICU and inpatient screening and consultations (Grudzen et al., 2016; Robbins et al., 2019; Wilson et al., 2020). The literature in this review supports and creates a foundation on this proposal's project.

## Theoretical Framework

The *Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care* (2015), provides a framework to promote evidence-based practices. It uses a pilot program to effect a change in practice, allowing for a potential towards sustainability. The steps to the Iowa Model include (1) problem identification, (2) forming a team, (3) literature review, (4) implanting practice change through a pilot program, and (5) disseminating the findings. There are three main decision points in the algorithm: (1) is this topic a priority for the organization? (2) is there sufficient evidence? and (3) is change appropriate for adoption of practice? At each point, the investigator's answer will determine whether to move forward, or to reassemble, redesign, or further research the topic. The decision points allow the investigator to consider ways to improve or redesign the project. The algorithm can be found in Appendix C: The Iowa Model.

### IOWA Model and this Project

#### *Steps One through Three: Problem Identification and Priority*

The project integrates the Iowa Model by first identifying the triggers where evidence-based practice change are needed. For this project, the triggers stemmed from a knowledge-focus trigger. The knowledge that PC interventions such as consultations and family meetings can reduce length of stays and improve healthcare outcomes is evident in the literature. Using a trigger assessment or a screening tool aids in the use of PC interventions. The next step in the model is to determine if the problem is a priority for the organization or department. Speaking to

stakeholders confirmed that this proposal's project would address the problems and was part of an initiative already in process by the nursing education department. The problem of late or absent PC consultation and long lengths of stay in the ICU at the project site was a problem for the facility. This project aims to address these problems and is a priority of the facility. This step is the first of three main decision points in the algorithm. The following step is to form a team. Interdisciplinary stakeholders, such as the medical director of critical care services, assistant director of nursing for medical ICU, director of palliative care services, and at least two lead registered nurses all have stakes for this project. They play an important role in critiquing the results when it comes time to present and disseminate.

***Steps Four through Six: Adequate Research***

The next step is to gather and analyzes the research related to the practice change. This step is addressed in the earlier part of the proposal, background and significance. The following step is to critique and synthesize the research. This is addressed in the literature review of this proposal. The algorithm then asks, is there sufficient research to implement a practice change? Already addressed in the literature review, there is an association with improved patient outcomes and early PC consultations. Because there is enough evidence to support the practice change, the next step is to implement a pilot program to change the current practice.

***Steps 7 through 8: Appropriate Practice Change***

After implementation of the project and gathering the data, an evaluation of results are the final steps. The third and final decision point ask the investigator about the appropriateness of adopting the change in practice. If the change is appropriate, then new practice is sustained. Dissemination of the project, results, and sustainability is presented and addressed to the

stakeholders. This will be addressed through a presentation and discussion of results in stakeholders' meetings and presentation to the Nursing Research Council at the project site.

### *Decision Questions*

If at any of the decision points the answer is no, the investigator must not move forward. The investigator must revisit the previous steps either by delving deeper into (1) the triggers and determining a problem of greater priority for the department or organization, (2) the research, and (3) the results and revisiting the previous steps with new information.

## Methodology

### Project Design

The quality improvement project used a retrospective analysis of pre-intervention data, a prospective analysis of post-intervention, and surveys. Chart reviews were completed pre-intervention to assess baseline data such as demographic information, time to PC interventions, length of stays, and changes to code status, such as full code to DNR and DNI. A 6-week range of the retrospective chart review was performed to gather the baseline data. The baseline data, the demographic information, time to PC interventions, length of stays, and changes to code status, such as full code to DNR and DNI, establish what is usual practice for the medical ICU. In addition, demographic information was gathered from the nurses as well as a survey of their comfort levels regarding PC issues. During 6-week intervention phase, nurses completed a screening tool to trigger PC interventions on all patients admitted to the medical ICU. A prospective chart review of data assessed the effect of the intervention on outcomes such as length of stay, time to PC intervention, and changes to code status. A final survey was used to assess nurses' comfort level post-intervention.

## Data Collection

Data was collected for pre- and post- intervention including demographic information and comfort levels of the nurses. A chart review was completed for pre- and post- 6- week intervention for patients admitted to the medical ICU. The specifics of the data and collection methods are outlined below.

### *Nurses*

Prior to implementation, data was gathered on participating nurses. Demographic data such as age, gender, years of nursing experience, years of ICU experience and highest level of education will be collected. In addition, a pre-intervention survey on comfort level with palliative and end-of-life care issues was collected to assess baseline comfort level. Comparison of pre-intervention with post-intervention comfort level was assessed with a survey. The final collection of data was an evaluation of the project.

The PC comfort level survey consisted of four questions focusing on the nurse's comfort with PC and end-of-life issues. A copy of the survey can be found in Appendix D: PC Comfort Survey.

### *Chart Review*

Baseline data establishing what is the usual patient population of the medical ICU was obtained by collecting patient demographic data such as age, gender, ethnicity, admitting diagnosis, admission date, code status on admission, and acute physiologic assessment and chronic health evaluation (APACHE) II data and score on admission. The APACHE II score is a critical care scoring algorithm based on twelve physiologic variables, age, and chronic health conditions. The scoring is used as a risk assessment for mortality and disease severity on newly admitted patients to the ICU. Patients with a score greater than 34 have an 85% nonoperative

mortality. Scores from 0 to 34 are stratified from 4% to 73% nonoperative mortality (MdCalc, n.d.).

Outcomes to be measured include length of ICU stay, PC consultation or referral order and the time to a PC intervention, and code status changes during the ICU stay. Collection of data as it relates to the outcomes to be measured establish the usual practice of the medical ICU. Data collection for these outcomes was collected via a chart review of the electronic medical record. During the intervention phase, demographic data as previously stated was collected. APACHE II scores were compared to the scores of the trigger assessment to assess for correlation of objective clinical and physiologic data with nursing assessment and identification. A chart review post-intervention collected the data as it relates to the outcomes being measured.

**Method of Measurement**

The APACHE II Score was calculated using an online calculator on the website MD + CALC (www.mdcalc.com). Data was collected via chart review to input into the calculator to calculate the APACHE II Score. The score calculates the predictive mortality rate of the patient based on physiological data. The higher the calculated score the higher the mortality. The scores are as follows:

Table 1:1

APACHE II Score and Mortality

| APACHE II SCORE | NONOPERATIVE | POSTOPERATIVE |
|---|---|---|
| **0-4** | 4% | 1% |
| **5-9** | 8% | 3% |
| **10-14** | 15% | 7% |
| **15-19** | 25% | 12% |
| **20-24** | 40% | 30% |
| **25-29** | 55% | 35% |
| **30-34** | 73% | 73% |
| **> 34** | 85% | 88% |

Note: (Knaus et al. ,1985).

**Setting**

The project was conducted in the medical ICU of a 519-bed urban academic hospital. The hospital is a stand-alone state facility serving as a level 1 trauma center for northern New Jersey. The medical ICU consists of 12 beds and cares for a variety of patients and critical care conditions. The unit is a closed ICU run by interns, residents, pulmonary critical care fellows, and attendings.

**Nurse Participants**

A total of 33 medical ICU nurses participated in the project, including the regularly employed, per diem, Additionally, nurses that float to the medical ICU from other ICUs, agency, critical care float pool were additional participants in the project. The potential sample is 80 participants with a target sample size of 35 nurses. Criteria for participation is any nurse that admits a patient into the medical ICU. There are no exclusion criteria for participation. 33 nurses were educated, 2 declined participation, and 3 were excluded from the project because of exiting the unit prior to conclusion of project.

**Participant Recruitment**

Because the project is a unit-wide quality improvement project, participation in the intervention and surveys are voluntary from all participants. A reminder flyer was posted in key areas of the medical ICU to encourage participation in the intervention. The key areas include the information board, workstation on wheels, break room, and the charge nurse's clipboard. These strategic areas reminded the nurses of the project's intervention and increase participation. As usual practice, the charge nurse assigns admissions to the nurse and documents admissions. Additionally, the charge nurse assesses for completion of admission required documentation. The charge nurse is an asset to the project and can be used as champions for the project. As champions the charge nurses can assist nurses in completing the trigger assessment and collect the trigger assessments to be stored properly. At any point participants may contact the principal investigator, this author, with any questions via telephone or electronic mail.

**Risks / Harms / Ethics**

The project presents minimal risk of harm to the participants. Data extraction tools was used to de-identify both charts and participants. The only record linking participants to the study would be the informed consent document, if it were needed. If informed consent and documentation were needed, a potential harm be a breach of confidentiality.

The medical ICU patient will potentially benefit from the intervention, as research has shown. Nurses as caregivers are likely to benefit from the project as well. Moral distress is a phenomenon that has been studied in clinicians caring for patients at the end of life. Distress occurs when an individual's beliefs are opposite of the care provided to the patient. These challenges such as futility of care, miscommunications between providers and families, and institutional constraints, increase the likelihood of caregiver moral distress, burnout, and

emotional exhaustion (Dzeng et al., 2016). PC can decrease moral distress among caregivers by decreasing futile care, increasing advance care planning, and improving communication (Hsu-Kim et al., 2015; Schubart et al., 2015).

**Consent**

As a quality improvement project that is unit wide, the participation in the intervention arm and survey of the project was voluntary. Therefore, a waiver of informed consent was approved from the Institutional Review Board. Information regarding the project were provided as informational flyers posted in the medical ICU. Chart data collected for the purposes of this project was within the standard care and documentation of the medical ICU. Therefore, for consent was not needed for collection of this data.

**Budget, Costs, and Compensation**

The project occurred at no costs to the participants. The trigger assessment to trigger PC interventions were integrated into the admission documentation requirements. There was no compensation for participation in the project. A total budget of 300 dollars was needed to obtain a Health Insurance Portability and Accountability Act (HIPAA) compliant drop box, laminated reminder flyers, copies of the trigger assessment tool, and copies of the surveys.

**Intervention**

The intervention arm of the project took place for 6-weeks. During the intervention phase, nurses completed a trigger assessment tool to trigger PC interventions on all patients admitted to the medical ICU. The tool for this project was adapted from Aspire Health in Chattanooga, Tennessee. Input from stakeholders allowed for modifications to the screening tool to develop a trigger assessment. The trigger assessment assessed patients in three areas (1) diagnoses, (2) modifiers, and (3) the surprise question. Nurses scored newly admitted or

transferred patients in these three areas. The total score was then calculated. The calculated score will determine the type of PC intervention the patient needs.

If a patient's total score is 5 or greater, the patient should be considered for a palliative care specialist consultation or referral. A total score of 8 or greater, the nurse should consider a family meeting within 48 hours for the patient. If the patient scores 10 or greater, the patient should be considered for immediate goals of care discussion with family. The nurses should then discuss their findings with the medical team. The trigger assessment can be found in Appendix E: Medical ICU Palliative Care Trigger Assessment.

PC interventions can be defined as PC specialists' consultations, informal and formal family meetings, and immediate goals of care discussions. Due to the restrictions during the current COVID-19 pandemic, additional PC interventions include phone calls and face time with family members by palliative care specialist. In addition, phone call updates to discuss goals of care made by non-palliative care specialists and are members of the providing treatment team (including chaplains, doctors, and nurses) can be considered a PC intervention. Given that hospital visitation is limited, electronic communication has become a primary mode of communication. On a regular basis, the medical resident team covering the ICU routinely call the patient's health care proxy and update them daily. However, these conversations do not always include palliative or end-of-life care discussions.

Once the participants have completed their trigger assessment, they discussed with the medical team to encourage a conversation about the patient's palliative care needs. It is then at the discretion of the medical team to either de-escalate or escalate the intervention and timing.

To keep track of completed trigger assessments; the admitting nurse submitted to the charge nurse. As the champions for the project, they placed all completed trigger assessments into a lock box as the they are completed.

**Outcomes to be Measured**

The outcomes to be measured in this project are (1) the time of admission to time of PC intervention, (2) ICU length of stay, and (3) changes to code status. Prior to the intervention phase these same outcomes were measured. A retrospective chart review spanning 6-weeks of patients admitted to the medical ICU measured these outcomes. This data establishes usual care for the medical ICU patient. The 6-week intervention phase implemented the trigger assessment, and a prospective chart review post-intervention measured these outcomes. By comparing and analyzing the usual care and post-intervention outcomes, the effect of the trigger assessment can be seen. The aim of the project is to improve on all these outcomes including nursing comfort levels regarding palliative care issues.

As already stated, comfort levels of the nurses, as it relates to PC and end-of-life issues, will be assessed via a 4-question survey. Though not a primary aim, the project aims to improve the nurses' comfort in identifying and assessing patients' PC needs. Additionally, the project aims to empower nurses in discussing their findings with the medical team.

## Project Timeline

Rutgers Institutional Review Board (IRB) approval and site approval was obtained on January 30, 2021. Prior to IRB approval, Rutgers Doctorate of Nursing Practice Chair was obtained in June 2020, and site approval was obtained on January 20, 2021. Due to the recent COVID-19 pandemic all measures will be taken to abide by the regulations and policy set forth

to protect against the spread of the disease. A Gantt timeline can be found in Appendix F: Project Timeline. The following is a timeline of the project:

1. Project Approval by DNP Chair, June 2020
2. Site Approval January 20, 2021
3. IRB Approval January 30, 2021
4. Project Start February 1, 2021
    a. Week One and two: Pre-Intervention Phase
        i. Recruited Participants, Educated Nurses, and Began Retrospective Chart Review
        ii. Pre-intervention Chart Review of Patients Admitted to ICU over a 6-week time period (
            1. Demographic Data
            2. Data Related to Outcomes to be Measured
        iii. Demographic Data of Nurses
        iv. Pre-Intervention PC Comfort Survey
    b. Week Three through Eight: Intervention Phase (6-weeks, February 14, 2021 to March 27, 2021)
        i. Weekly Huddles with Participants
            1. Continued to Educate Nurses on Intervention: Trigger Assessment
            2. Continued to Educate Nurses on HIPAA Compliance with Trigger Assessments
        ii. Continued Retrospective Chart Review
        iii. Began Prospective Chart Review

c. Week Eight and Nine: Post intervention Phase
    i. Post-Intervention Data Collection
        1. Post-intervention Chart Review of Patients Admitted to ICU over a 6-week time period (6-weeks, February 14, 2021 to March 27, 2021)
        2. Demographic Data
        3. Data Related to Outcomes to be Measured
    ii. Post-Intervention PC Comfort Survey
    iii. Post-Intervention Project Evaluation Survey
d. Week Nine
    i. Data Analysis

## Evaluation Plan

At the close of the intervention, an-open-ended questionnaire was completed by participants, charge nurses, and other stakeholders to evaluate the project. A copy of the questionnaire can be found in Appendix G: Project evaluation. The questionnaire aims to evaluate the overall project and sustainability of the trigger assessment. These are the questions:

1. What are the successes and difficulties of the trigger assessment, its use, and the overall project?
2. Do you believe that the trigger assessment can be used in everyday practice? Why or why not?
3. If the trigger assessment was adopted as usual practice, what would you do to improve the overall process?

In addition to the questionnaire, a huddle with the nurses, charge nurses, and stakeholders was completed to identify areas of change, improvement, pitfalls, and successes of the project.

## Data Analysis Plan

### Statistical Analysis

Statistical analysis for the pre- and post-intervention data determined statistical significance in the outcomes to be measured. Descriptive statistics was used to summarize the demographic data such as age, gender, diagnosis, and APACHE II data and scores. In addition, descriptive statistics was used to summarize patients' length of ICU stay, changes to code status, and time to PC intervention. A paired t-test was used to compare participants comfort level pre- and post-intervention.

### Data Maintenance and Security

To maintain HIPAA compliance, several protocols were followed. First, all data collected with identifiers was severed once data is transferred into a Microsoft Excel file. For instance, Chart A admitted on July 1, 2020 will be row 1 on Excel. The same process occurred for the nurse's data. After all data was gathered and after the collection period has ended, chart and nurse identifiers will be destroyed. The data was stored in the project leader's password protected computer with 32-bit encryption. Second, completed trigger assessments was placed in a locked drop box at the nurse's station. Collection of trigger assessments was completed weekly by the project leader. Afterwards, trigger assessment data were transferred to Excel and chart identifiers were severed as in the first protocol. Excel spreadsheets can be found in Appendix H: Excel Data Extraction. Figure 1 outlines the data extraction tool for patient's pre-intervention. Figure 2 outlines the data extraction tool post-intervention. Lastly, Figure 3, outlines the data extraction tool for the nurses. Third, only the project leader and principal investigator will have

access to the data. These efforts and diligence will help to maintain privacy and confidentiality of all personal health information (PHI) of charts and personal information of participants.

## Results

### Charts

#### *Pre-Intervention*

A retrospective chart review established baseline data on usual practice for the ICU. On average there were 16.3 patients admitted to the unit per week. The average APACHE II score for those admitted was 18.5, with a 25% nonoperative mortality prediction. To account for the vast differences and multiplicity of admission diagnoses, charts were assessed for the primary admitting diagnosis and categorized into 6 main diagnoses: (1) Neurological Failure (2) Cardiac Failure. (3) Respiratory Failure, (4) Hematological, Oncological, Endocrine Failure, (5) Gastrointestinal and Genitourinary Failure and (6) Other. Neurological failure includes status epilepticus, cerebrovascular accidents, and its related conditions, and altered mental status. Cardiac failure includes congestive heart failure exacerbations and cardiac arrest. Respiratory failure includes acute respiratory distress syndrome, chronic obstructive pulmonary disease, asthma exacerbation, and respiratory failure from a variety of conditions. Hematological, oncological, and endocrine failure includes sepsis and its related counterparts, cancer emergencies, and diabetic ketoacidosis. Gastrointestinal and genitourinary failure includes liver failure and its related counterparts, liver transplant evaluation, and renal failure and its related counterparts. The other category is for any conditions not listed above including traumas and fractures.

PC consultations included informal family meetings, emotional and spiritual support, discussion with medical team for role of PC to the patient’s care, advance care planning, goals of

care discussions, or initial assessment of PC needs of the patient. Family meetings and goals of care discussions (GOC) were either completed by the MD or the PC specialist.

The demographic data and clinical characteristics are outlined in table 2.1.

Table 2.1 Baseline Characteristics of the ICU Patients (n=100)

| Characteristics | Mean (SD)/% | Characteristics | Mean (SD)/% |
|---|---|---|---|
| **Age** | 58 y (SD 16) | **APACHE II Score** | 18 |
| **Sex** | | **ICU Length of Stay** | 5.2 Days |
| **Male** | 53.47% | **Conversion of Code Status** | 18 Days |
| **Female** | 46.53% | **Time to PC Intervention** | 6.5 Days |
| **Race** | | **Disposition** | |
| **Black or African American** | 52.48% | **Med/Surg** | 51.54% |
| **Hispanic, Latino, LatinX** | 23.76% | **PCU** | 29.70% |
| **White or Caucasian** | 11.88% | **Expired** | 10.89% |
| **Other** | 11.88% | **Tele** | 4.95% |
| **Admitting Diagnosis** | | **Other** | 2.92% |
| **Neurological Failure** | 41.58% | **Mortality In ICU** | 11% |
| **Heme/Onc/Endo Failure** | 22.77% | **PC Intervention** | |
| **GI/GU Failure** | 15.84 | **PC Consultation** | 47.52% |
| **Respiratory Failure** | 9.90% | **Family Meeting - MD/PC** | 10.89% |
| **Other** | 6.93% | **GOC Discussion – MD/PC** | 12.87% |
| **Cardiac Failure** | 2.97% | **Other / None** | 28.71% |

Abbreviations: SD – Standard Deviation: Heme – Hematological; Onc – Oncological; Endo – Endocrine; APAHCE II – Acute Physiology and Chronic Health Evaluation II; ICU – Intensive Care Unit; PC – Palliative Care; Med – Medical; Surg – Surgical; PCU – Progressive Care Unit; Tele – Telemetry; MD – Medical Doctor; GOC – Goals of Care; PC – Palliative Care

Of the 100 charts reviewed, 29% did not receive a PC intervention, of those, 28 did not receive a consultation order, and 17 received an order but there was no PC intervention. On average, from consultation order to PC intervention was 1.8 days. Time to PC intervention from admission, on average, was 6.5 days. On admission to the ICU, there are 92 “Full Code” statuses, 5 “DNR” statuses, and 3 without a code status order. Conversation of code status occurred in 29 charts and of the total, 28 were converted from full code. One chart revealed an escalation of their code status, from DNR to Full Code on discharge from the ICU. Conversion of code status occurred on average at 18 days from admission. ICU length of stay averaged about 5.2 days, with 51.54%, the majority, discharged to a medical/surgical unit. Mortality in the ICU was 11%.

***Post Intervention***

A prospective chart review revealed 73 charts of patients admitted during the 6-week time frame. On average, the unit admitted 12 patient per week. Of the 73 charts reviewed, 19% did not receive a PC intervention, of those, 12 did not receive a PC consultation order and 3 received a consultation order without a PC intervention. 2 charts received an PC intervention without an order. The average time to PC intervention from PC consultation order was 1.7 days. On average, the time from admission to PC intervention was 5 days.

On admission to the ICU, 100% of charts had code statuses ordered, 68 “Full Code” and 5 “DNR” status. Conversion of code status occurred in 31 charts, and of those charts only 2 were escalation of their code status. On average conversion of code status occurred at 15 days since admission. The average ICU length of stay was 5.7 days, with most of the patients discharged to progressive care unit, 38.26%. The category of “other” on disposition includes patients that are currently in the unit as of 5 days after the end of conclusion of the intervention phase, discharge against medical advice, and transfer to another intensive care unit. A total of 6 patients remained in the ICU after the conclusion of the intervention arm of the project. The ICU mortality was 20%. Table 2.2 outlines the post-intervention characteristics of the ICU patients.

Table 2.2 Post-Intervention Characteristics of the ICU Patients (n = 73)

| Characteristics | Mean (SD) / % | Characteristics | Mean (SD) / % |
|---|---|---|---|
| **Age** | 59 y (SD 14) | **APACHE II Score** | 20 |
| **Sex** | | **ICU Length of Stay** | 5.7 Days |
| **Male** | 49.32% | **Conversion of Code Status** | 15 Days |
| **Female** | 50.68% | **Time to PC Intervention** | 5 Days |
| **Race** | | **Disposition** | |
| **Black or African American** | 39.73% | **Med/Surg** | 20.55% |
| **Hispanic, Latino, LatinX** | 32.88% | **PCU** | 38.36% |
| **White or Caucasian** | 12.33% | **Expired** | 20.55% |
| **Other** | 12.33% | **Tele** | 9.59% |
| **Admitting Diagnosis** | | **Other** | 10.96% |
| **Neurological Failure** | 28.77% | **Mortality In ICU** | 20% |
| **Heme/Onc/Endo Failure** | 12.33% | **PC Intervention** | |
| **GI/GU Failure** | 27.40% | **PC Consultation** | 54.79% |
| **Respiratory Failure** | 28.77% | **Family Meeting - MD/PC** | 4.11% |
| **Other** | 0% | **GOC Discussion – MD/PC** | 16.17% |
| **Cardiac Failure** | 2.74% | **Other / None** | 20.55% |

Abbreviations: SD – Standard Deviation; Heme – Hematological; Onc – Oncological; Endo – Endocrine; APAHCE II – Acute Physiology and Chronic Health Evaluation II; ICU – Intensive Care Unit; PC – Palliative Care; Med – Medical; Surg – Surgical; PCU – Progressive Care Unit; Tele – Telemetry; MD – Medical Doctor; GOC – Goals of Care; PC – Palliative Care

The trigger assessment reached 97.26% compliance. Of the 73 charts reviewed, only 2 trigger assessments were not completed. The scores were tallied based on the triggered intervention, 23 charts did not meet criteria for a PC intervention, 28 met criteria for a PC consultation, 7 met criteria for a family meeting, and 13 met criteria for an immediate goals of care (GOC) conversation. The highest score a patient received was an 18, and the average score for patients was a 6. The trigger assessment triggered 67% of admissions. Of the 14 charts that did not receive a PC intervention, only 7 of them received a score of less than 5 on the trigger assessment, the remaining 7 were triggered for a PC consultation.

## Nurses

### *Pre-Intervention*

A sample size of 31 nurses completed the pre-intervention comfort survey and demographics. 3 participants were excluded because one did not admit patients into the ICU, the

other left the position prior to the conclusion of the project and the last one left on medical leave prior to the conclusion of the project. Total sample size is 28 participants. Demographic data was collected on the participants and is outlined on Table 2.3.

Table 2.3 Characteristics of the participants (n = 28)

| **Characteristics** | **Mean (SD) / %** |
|---|---|
| **Age** | 42 y (SD 10) |
| **Sex** | |
| **Male** | 21.42% |
| **Female** | 78.57% |
| **Years of Nursing Experience** | 15.9 y |
| **Years of ICU Experience** | 12.4 y |
| **Highest Level of Education** | |
| **Practical Nursing** | 1 |
| **Associate's Nursing** | 1 |
| **Bachelor's Nursing** | 23 |
| **Master's Nursing** | 2 |
| **Some Post Bachelor's** | 1 |
| **Doctorate** | 0 |

The median scores of the comfort survey are as follows (scores in italics):

1. How comfortable are you in identifying patients at the end of their life?
   *Moderately Comfortable*
2. How comfortable are you in identifying patients with chronic and life limiting disease?
   *Moderately Comfortable*
3. How comfortable are you in assessing which patients are in need of a palliative care intervention?
   *Moderately Comfortable*
4. How comfortable are you in discussing your assessment of palliative care needs to the medical team?
   *Moderately Comfortable*

Only one participant reported to be moderately uncomfortable in 3 of the 4 questions. Points were assigned to the Likert scale responses. The highest score is an 8, meaning the participant is comfortable in all 4 questions. The lowest score is -8, meaning the participant marked uncomfortable in all 4 questions. A score of 0, means the participant marked neutral on all 4 questions. The average score was 4.5 with a standard deviation (SD) of 2.9.

***Post-intervention***

Participants were asked the same 4 questions after the intervention phase. The median response was comfortable in all 4 questions. Participants reported higher scores post intervention (*Mean* = 6.87, *SD* = 1.5) compared to pre-intervention.

## Discussion

The intervention phase was 6 weeks. Due to the increased acuity of patients, sudden wave of COVID-19 patients, this may account for some of the results of the project, such as increased length of stay, fewer admissions, increased discharges to PCU, and missed interventions. Discussion of findings are below based on outcomes measured.

Due to the recent COVID-19 pandemic, the volume of admissions to the medical ICU service has increased and is unknown if the volume and rate will remain high in the coming months. Additionally, the pandemic has affected the usual variety of patients that are admitted to the medical ICU and may have affected the projects outcomes. Further, COVID-19 has changed the way the PC team interacts with families as it relates to consultations and family meetings. All PC and medical team interactions with family members of intubated patients occur electronically either by phone or face time. Limitations in visitation, laymen fear of COVID, hospital policy all affect family interactions, which may alter outcomes. All social distancing and personal protective equipment requirements such as use of masks were strictly followed for the duration of the project and were adjusted as hospital protocol dictates.

### Length of Stay

In this analysis it is found that length of stay slightly increased in the intervention phase than in the baseline data. The mean difference between baseline and the intervention is 0.5 days. This is likely due to the increased number of patients with respiratory failure from COVID-19.

Of the 73 charts reviewed, 15 patients were admitted for COVID-19 related respiratory failure. In the baseline group of the 100 charts reviewed, only 2 were admitted in the ICU. The end of the intervention phase saw an increased number of COVID-19 admissions. Another explanation for the increased length of stay could be that the average APAHCE II score was higher in the intervention phase than the baseline, indicating that the patients were sicker than in the baseline. An average score of 20 indicates a 40% mortality, when compared to the baseline score of 18 indicating a 25% mortality. This is also evidenced by the increased number of discharges to a progressive care unit rather than the high incidence of discharge to a medical surgical unit and the mortality than the baseline. The small change in the length of stay is also suggested in the literature (Ma et al., 2019)

**Code Status**

Post-intervention data suggests a 39% conversion of code status. Pre-intervention data suggests a 28% conversion of code status. In both the baseline and intervention phases, there were at least one chart that revealed an escalation of their code status. However, of these patients most were discharged from the ICU with a DNR in place. The average time in days from admission to code status change was quicker in the intervention phase ($M$ = 15.5 days post intervention versus $M$ = 18.8 days pre-intervention). Therefore, the intervention saw a more frequent and quicker conversion of code status from Full Code to DNR.

**PC Intervention**

The average time in days to intervention was decreased in the intervention phase ($M$ = 4.9 post intervention versus $M$ = 6.5 pre intervention). The average time in days from PC consult to PC intervention was relatively the same in both phases ($M$ = 1.8 pre intervention versus $M$ = 1.7 post intervention). The PC team is regularly involved in the ICU and are present in bi-weekly

multidisciplinary rounds. This suggests that patient who do not receive a PC consultation or intervention may not have needed one as part of a discussion during multidisciplinary rounds or vice versa. This may explain why some patients received a PC intervention without an order. Additionally, this may also explain why both in the baseline and intervention phase, patients who needed PC intervention but did not receive them. As a continued theme in the literature, PC intervention is either received too late or not at all in their hospital stay.

More than 2/3 of patients admitted to the ICU required a PC intervention based on nursing assessment. Though not a validated tool, it seems that the trigger assessment is appropriately increasing consultation and intervention rates of the ICU. Only 7 patients were deemed inappropriate for PC intervention and were appropriately followed. This suggests accurate designation of resources. The other 5 may be explained by a de-escalation of assessment of need based on the medical teams' findings. As a workflow process the nurse completing the trigger assessment discussed their findings with the medical team. The team then would discuss whether the intervention was appropriate. Only triggered consultations were the ones de-escalated. More often the intervention was met or was escalated. An important finding is that the trigger assessment identified that 17% of admission required an immediate GOC of discussion with the patient or the family. Overall GOC discussions constituted 16% of interventions. This percentage may be higher because PC consultation may include advance care planning and GOC discussions in the specialist's initial consultation.

**Comfort**

The mean scores post intervention, suggest that the participants reported an increase in comfort levels on all aspects of PC (identification, assessment, and discussion). Paired t-test analysis revealed statistical significance, $t(27) = -5$, $p = <.05$, of the trigger assessment on

comfort levels of the participants. Through discussions and observations with the participants on a weekly basis and evaluation of the project, receptivity, and comfort in using the trigger assessment increased. The PC trigger assessment increased comfort of the nurses in PC and end-of-life issues by providing objective data on which patients need PC services. Further, the trigger assessment empowered nurses to voice their opinion that is rooted in objective data.

**Implications**

The project and its results are consistent with the growing body of evidence to support the early use of PC in the ICU. If adopted as usual practice the ICU could stand to benefit from increase PC use and appropriate designation of resources. Increased PC use is associated with decreased healthcare expenditure. Though the project resulted in an increased length of stay, it was an incremental increase that could be explained by the wave of COVID-19 patients, the project demonstrated positive outcomes to time to PC intervention and consultation, conversion of code status to DNR, and nurse comfort levels.

The project demonstrated appropriate use of PC services to patients in need of PC intervention. When the trigger assessment did not deem a PC intervention appropriate, there was not a PC intervention completed. When a trigger assessment deemed a GOC discussion was appropriate for the patient, a GOC discussion was completed. Only 1% of the time was a GOC discussion not completed. However, PC specialist often include GOC discussion in their initial consultation therefore, 1% may not accurately represent the amount of GOC discussion completed during the intervention. Appropriation of resources, particularly in a pandemic, are cost-effective and efficient means to care for patients.

The positive effects on outcomes such decreased length of stay and increased quality of life are related with use of PC services. PC value increases as quality of life increases and

decreases length of stay. Conversely as positive clinical outcomes increase PC value, inpatient PC services decrease hospital expenditure. A statistically significant overall cost savings of 9-25% have been found in several studies. These cost savings were found in a variety of patient settings and care delivery. Additionally, it has been studied that a reduction of 32% for all healthcare occur post discharge when PC services are involved. Moreover, PC services have been found to be less costly than usual practice (May et al., 2014). If there is an overall cost savings of 9% using less costly services while providing quality care, then healthcare policy must follow the evidence by using PC services earlier rather than later. In the context of the current COVID-19 pandemic, when resource allocation, cost-effectiveness, and limited resources are the realities of hospitals suffering from the surge of critically ill patients, PC services are even more vital than ever.

The project found an increase in PC use and increase in nurse's comfort levels in identifying, assessing, and discussion of PC need. As the nurses become more comfortable with PC issues then increased use of PC services and interventions can help nurses avoid or decrease the amount of moral distress. This is important to note, because ICU mortality for COVID-19 patients remains high, despite lifesaving interventions. Many of these interventions are physically demanding on nursing and nursing staff, such as manual proning. Despite these interventions, mortality is still high for these patients, thereby increasing moral distress for the nurses. A recent study discovered that patients with COVID-19, on mechanical ventilation, vasopressors, and renal replacement therapy had a median length of state of 20 days, and increased morality of 71.6% (Domecq et al., 2021).

## Project Evaluation and Plans

The project was evaluated with the use of an open-ended survey, asking 3 questions. Overall, the project was accepted as a "good" project. The project was compared to the other DNP projects implemented on the unit, and it was anecdotally commented that the trigger assessment was the easiest amongst the others. Participants liked the ease of use and given the recent wave of COVID – 19 patients, was necessary for the current state of the pandemic. Participants suggested to incorporate the trigger assessment in to the EMR to facilitate even easier use.

### Successes

The project was successful in educating and recruiting participants. Only 2 nurses opted out of participating for personal or undisclosed reasons. Participation was easy to glean, as previous projects have already laid the foundation for this project to take place. Charge nurses played an important role in facilitating compliance with completion of the trigger assessments and facilitating discussions with the medical team regarding a patient's need for PC intervention. The project was successfully implemented as regular practice, reaching approximately 98% compliance.

### Failures

Upon review of the trigger assessments, some wording was deemed confusing. A section on the patient modifiers that scores the patient one point if they did not have an advance directive; was worded as "no advance directive," which confused participants and was often overlooked. However, because of the weekly discussion in huddle, the confusion was quickly corrected. As part of the evaluation, a few of the participants wished to add COVID-19 as part of the diagnoses, which would appoint 2 points to the patient. This was addressed during the

huddles. There is a section on the diagnosis that states “other serious and progressive illness.” If the participant deemed COVID-19 as a “serious and progressive illness” then the participant could assign 2 points to the patient’s trigger assessment. The 2 nurses that declined participation with the survey are considered failure to this author. A follow up interview revealed they declined participation due to personal reasons. Only 2 trigger assessments were missed during the intervention arm. Upon interview of the charge nurses during those shifts, acuity on the unit and short staffing were an issue to the compliance of project. However, the 2 patients that missed a triggered assessment received PC consultations within 3 days of admission.

**Plans for Sustainability and Translation**

Dissemination of the project results and implications will be presented to the stakeholders including the critical care and education department leaders as well as the Nursing Research Council. In this setting, sustainability can be discussed. Nurses at this facility, on a regular basis, assess and complete trigger assessments for wound care and chaplaincy services. Therefore, a quick and simple PC assessment that triggers a PC services would not be a new practice. The trigger assessments for wound care and chaplaincy services are required documents to be completed within 24 hours of admission. A mandatory documentation of a PC assessment that triggers PC services would aid in increasing PC referrals and services. The PC specialists at the project site have expressed interest in using a formal PC assessment to increase referrals and services. If the project were to be successful, stakeholders such as the PC team and critical care services look to benefit.

**Plans for Dissemination and Professional Reporting**

After the completion of the project, the results will be reported to the Rutgers School of Nursing via a power point presentation and poster as required by the DNP program. In addition,

a presentation will be made to key stakeholders and the Nursing Research Council at the project site. The stakeholders at the project site include the Pulmonary Critical Care Services Division, PC team, medical ICU clinical providers, and the Nursing Education and Research Council. All stakeholders will be given a summary and discussion of results of the project.

## Conclusion

This project demonstrates a successful integration of a PC trigger assessment into the ICU. LOS was slightly increased during the intervention phase but can be accounted for due to the increased acuity and wave of COVID-19 patients. On the other outcomes to measured, conversion of code status occurred quicker and more frequently than in in the usual care group. Time to PC intervention also occurred quicker than in the baseline group. Additionally, the nurses' comfort levels increased with the use of the PC trigger assessment. Simultaneously the project demonstrated increase in PC intervention, increasing the value of PC. Evaluation of the project by the participants deemed the project a necessary part of the ICU care, especially amid a pandemic. Overall, the project met its aims at increasing use of PC services and increasing comfort of the nurses.

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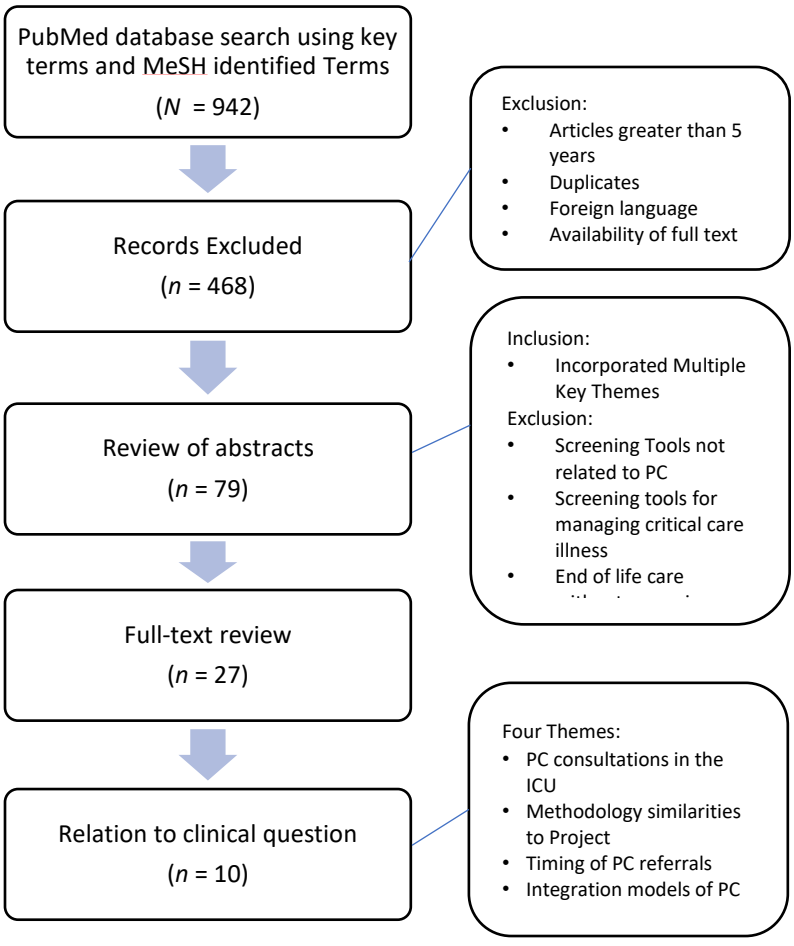
## Appendix A: MeSH Terms and PRISMA DIAGRAM

**Table 1:** MeSH Identified Terms Table

| Key Terms | MeSH Terms |
|---|---|
| (1) Palliative Care | Palliative<br>Palliative medicine<br>Terminal care<br>Hospice care<br>End-of-life<br>End-of-life care |
| (2) ICU | Intensive care<br>Critical care<br>Intensive care units<br>Critical care nursing |
| (3) Screening / Triggers | Screening<br>Precipitating factors<br>Trigger |
| (4) Outcomes | Treatment outcomes<br>Critical care outcomes<br>Administrative outcomes |

Figure 1: PRISMA Diagram



## Appendix B: Table of Evidence

Student: Leonne James R. Ramiro

Faculty: Dr. Darcel M. Reyes, Ph.D., ANP-BC

DNP Project Chair: Dr. Ying-Yu Chao, Ph.D., RN, GNP-BC

Full Title of DNP Project: Effects of a Palliative Care Trigger Assessment on Patient Outcomes for Patients Admitted in the Medical Intensive Care Unit

**Table A1**

*Table of Evidence*

| Article # | Author & Date | Evidence Type | Sample, Sample Size, Setting | Study findings that help answer the EBP Question | Limitations | Evidence Level & Quality |
|---|---|---|---|---|---|---|
| 1 | Ma et al. (2019) | Randomized control (crossover) trial | Sample: Patient's 18 years or older admitted on a weekday to the medical ICU that screen positive for at least one item were eligible for enrollment<br><br>Sample Size: 242 patients were eligible for enrollment, total | The study found that early triggered PC intervention led to an increased conversion of full code to DNR/DNI and hospice referrals.<br><br>The intervention group yielded no difference with | The study was only conducted on weekdays and enrollment of patients in the intervention arm were capped depending on the workload of the PC specialist team.<br><br>Further analysis of the patient's | Evidence Level: II<br><br>Quality: Good |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | of 199 met criteria<br><br>Setting: Single-academic center comprising 2 medical ICUs with 34 beds combined | length of stay and mortality.<br><br>The intervention group revealed a statistical significance when measure transfer to hospice. | that transition to a DNR status is needed as it relates to length of stay. The question can be asked is there an association with DNR/DNI status to length of ICU stay. | |
| 2 | Wilson et al. (2020) | Systematic review | Sample: Literature was qualified for inclusion to the study if articles tested the effects of PC interventions in the emergency department<br><br>Sample Size:13 articles were included in study after stringent criteria, initial search yielded 5627 articles<br><br>Setting: literature dating before September 1, | Measuring time to PC consultation in the emergency department group was shorter than the usual care in the reviewed articles.<br><br>The investigators found that length of stay was shorter for patient who received emergency department-based PC interventions, in multiple studies. Only one study showed no statistical | Most of the reviewed studies took place in an academic facility, affecting generalizability.<br><br>The stringent criteria may have excluded articles relevant to the research question. | Evidence Level: I<br><br>Quality: Good |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2018, in 5 different databases, 1 randomized control trial, 4 descriptive designs, 7 retrospective studies, and 1 prospective study | difference in this outcome. | | |
| 3 | Robbins et al. (2019) | Retrospective cohort study | Sample: Deceased patients 18 years or older in a hospice agency that received PC consultation at Vanderbilt Medical center either as inpatient or outpatient in 2014<br><br>Sample Size: 233 deceased patients were included in the study that matched the criteria, 36 were considered to have early PC referrals, and 197 were late (less | The retrospective study revealed that early PC referral, greater than 90 days before death, were associated with less ICU use at the end-of-life and increased length of stay in hospice.<br><br>Early referral to PC was statistically significant compared to late referrals when median number of ICU days were measured, 0 and 3, respectively. | Results from a study of a single institution and single hospice center may not be generalizable.<br><br>The study did not account for ICU use if participants used a different facility.<br><br>The sample size was relatively small for the design study. | Evidence Level: IV<br><br>Quality: Good |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | than 90 days before death)<br><br>Setting: large urban tertiary referral center, single nonprofit hospice agency | | | |
| 4 | Vanbutsele et al. (2018) | Randomized control trial, non-blinded | Sample: Patients 18 years or older with laboratory confirmed advanced solid-tumor cancer from several oncology specialties of [redacted] in Flanders, Belgium<br><br>Sample Size: 186 patients were included in this study, 92 intervention patients, and 94 standard oncology care patients | Early palliative care involvement in advanced solid-tumor cancer patients statistically improved quality of life indicators than those who received usual oncology care. | Because of the study's design transferability may not be possible and crossover effect cannot be ruled out.<br><br>The PC specialist involvement was multifaceted in the patient's care; therefore, it is not possible to determine what intervention was effective. | Evidence Level: II<br><br>Quality: High |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Setting: Patients were screen for eligibility from April 29, 2013 to February 29, 2016 at large academic hospital in Belgium | | | |
| 5 | Jones & Bernstein, (2017) | Pilot program – quasi - experimental study | Sample: Program was conducted in one ICU with 16 beds<br><br>Sample Size: Not mentioned in the article<br><br>Setting: suburban health care system, [redacted], a multisite hospital system based in Northern Kentucky and the greater Cincinnati area, the study was conducted in August | An automatic EMR trigger assessment with simple triggers identified 20 patients in August. 11 consults were ordered via the best practice advisory alert. 4 more patients were identified outside of the trigger criteria that received PC consults. When compared to the previous year, only 27 PC referrals were order for the entire year. | The length of study was short and only one outcome was measured, PC referral orders. It is unclear if PC referrals orders led to interventions.<br><br>Although there was an increase in automated referral notices for nurses and clinicians to order, the study is unclear on how many patients were admitted into the ICU in that month. | Evidence Level: III<br><br>Quality: Low |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | The study also does not quantify whether these best practice alerts were ignored, considered not appropriate, or who ordered the referral. | |
| 6 | Zalenski et al. (2017) | Retrospective analysis of a prospective quasi-experimental study | Sample: The population represented African America, Caucasians, and Latino patients with a median age of 65.3 (intervention group) and 70 (usual care group); 1923 patients were admitted into ICUs across all hospitals.<br><br>Sample Size: 405 patients screened positive for PC triggers, 161 patients received a PC consultation | When length of stay was analyzed by number of days to PC consultation, patients in the intervention group who received consultations in <7 days showed reduction in stay compared to the usual care group. This measure did not show statistical significance likely because of its smaller sample. | Further study is needed to assess why some nurses did not screen patients and why consultation orders were not place by physicians. Approximately only 60% of patients were screened during the study period. Of the 60% that were screen only 40% received PC consultation orders. | Evidence Level: III<br><br>Quality: High |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | (intervention group), and 244 did not<br><br>Setting: 7 hospitals participated in the study, all academic, 2 urban tertiary hospitals were university affiliated, 5 were community hospitals, of the 5 2 were in the suburbs. All hospitals served in a metropolitan area the Midwest and 1 in South Texas. 16-week study completed between October 15, 2012 to April 21, 2013 | The intervention group had a statistically significant association with increased orders for a change of code status from full code to DNR. | | |
| 7 | Mun et al. (2016) | Pre and postintervention, quality improvement study | Sample: All adult patients admitted into the 15-bed medical ICU representing a variety of medical and surgical patients, | Length of hospital stay was reduced in the postintervention group representative of statistical significance. | The measured outcomes did not specify conversion of full code status to DNR, but it rather identified that there was | Evidence Level: III<br><br>Quality: Good |

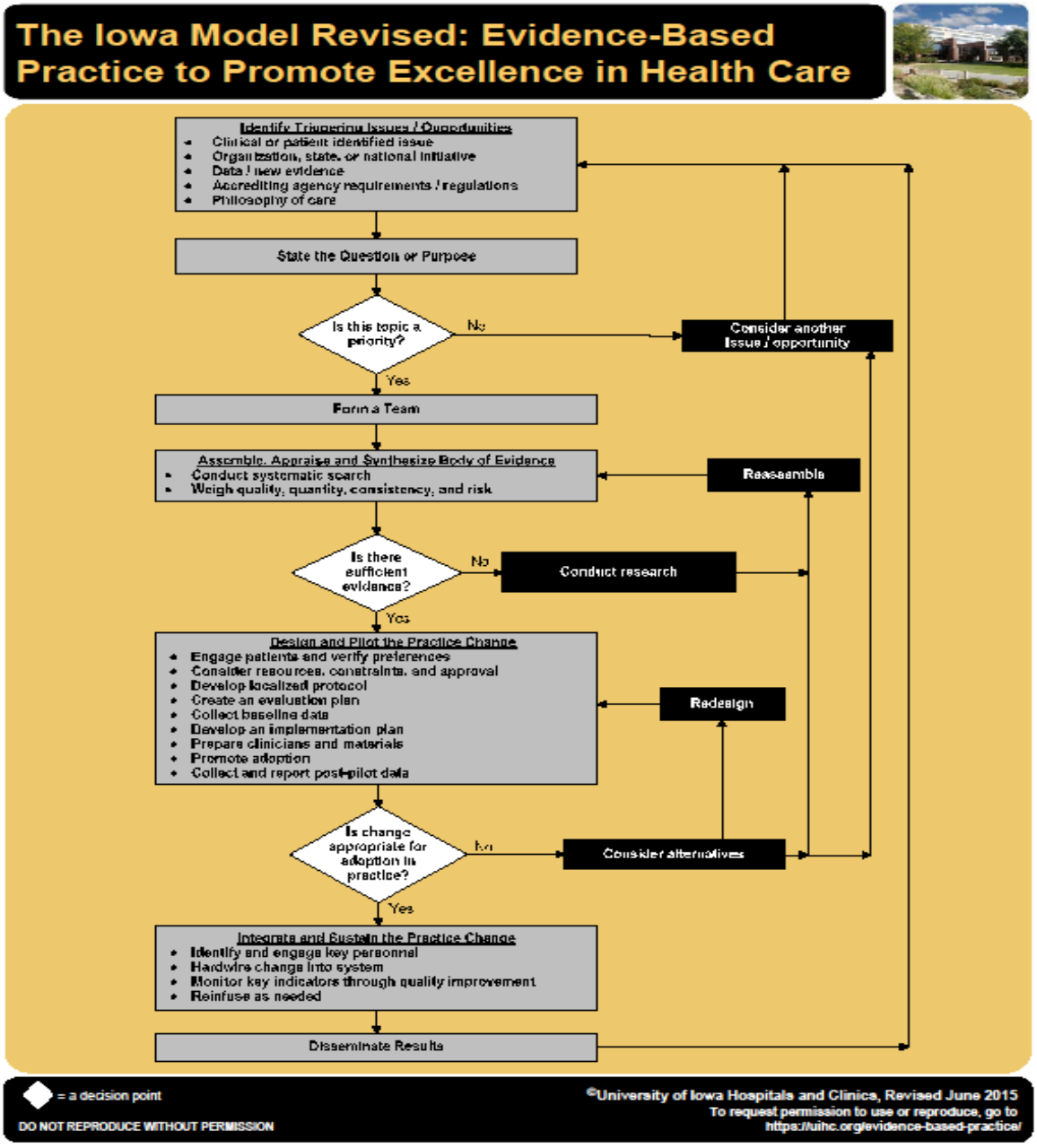
| | | | | | | |
|---|---|---|---|---|---|---|
| | | | excluding postoperative open-heart surgical patients<br><br>Sample Size: Total size 392 patients. Preintervention data was completed via chart review from November 1, 2013 to January 30, 2014 and included 194 patients. Postintervention patients comprised 198 patients, data was collected from April 1, 2014 through June 30, 2014<br><br>Setting: Medical ICU of [redacted] in Honolulu, HI | Goals of care, change in code status, and PC intervention such as family meeting were also statistically significant when compared to the preintervention group. | establishment of goals of care.<br><br>A single study site may suggest that findings are isolated and not transferrable. | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8 | Kyeremanteng et al. (2018) | Systematic review and cost evaluation | Sample: Admitted adult ICU patients or adult patients in need of ICU care, and received PC services in the ICU<br><br>Sample Size: Initial search yielded 814 studies. After full-text studies were reviewed 8 papers were included in the review<br><br>Setting: Literature was searched through 4 databases, with papers published from 2000 to February 2016 | Half of the studies illustrated statistical significance for patient who received PC interventions and a reduction in their length of stay. | All the studies were performed in a single center sites affecting transferability.<br><br>Many of the studies left room for bias, it is difficult to blind due to the nature of the PC intervention. | Evidence Level: I<br><br>Quality: High |
| 9 | Gruzden et al. (2016) | Randomized clinical trial, single blind | Sample: Adult patients with advanced cancer, cognitive screening was performed, if passed the patient was eligible for | There were no statistically significant differences in the length of stays for either the intervention | The eligible patients presented to the emergency department had variable survival lengths. The reason for emergency | Evidence Level: II<br><br>Quality: Good |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | the study, must speak English or Spanish<br><br>Sample Size: 298 eligible patients were identified, 136 were approached and enrolled in the trial,<br><br>Setting: Emergency department of a quaternary care referral center, [redacted] in New York City; ED patients were screen for advanced cancer criteria from Sunday to Friday, From June 2011 | group or the usual care group. | department visit was not addressed and might affect length of hospital stay. | |
| 10 | Jenko et al. (2015) | Pilot project, pre and post implementation study | Sample: 27 nurses took part in the study, 14 had less than 5 years' experience as a registered nurse, and 16 had less | PC referrals increased 110% but days from ICU admission to referral increase, though not | Study focused on nurses' comfort and knowledge of PC trigger tools.<br><br>In a small underpowered | Evidence Level: III<br><br>Quality: Low |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | than 5 years as an ICU nurse, 65% of participants were associate degree prepared nurses<br><br>Sample Size: 27 nurses<br><br>Setting: Not-for-profit community hospital in the southeastern United States; 12-bed medical ICU | statistically significant. | pilot study results may be isolated. | |

## Appendix C: The Iowa Model

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## Appendix D: Palliative Care Comfort Survey

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**Medical ICU Palliative Care Trigger Assessment Project**

**Nursing Demographics and Palliative Care Comfort Survey**

Thank you for your participation in this DNP Project.
Please fill out this form.

**Demographics**

Name:

Age:

Gender:

Years of Nursing Experience: (Round to the Closest Year)

Years of ICU Experience: (Round to the Closest Year)

Highest Level of Education:

**Survey**

1. How comfortable are you in identifying patients at the end of their life?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Uncomfortable | | Neutral | | Comfortable |

2. How comfortable are you in identifying patients with chronic and life limiting disease?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Uncomfortable | | Neutral | | Comfortable |

3. How comfortable are you in assessing which patients are need of a palliative care intervention?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Uncomfortable | | Neutral | | Comfortable |

4. How comfortable are you in discussing your assessment of palliative care needs to the medical team?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Uncomfortable | | Neutral | | Comfortable |

V1 12.17.20

## Appendix E: Medical ICU Palliative Care Trigger Assessment

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Name:
Date:
Time:

Patient Label

**Medical ICU Palliative Care Trigger Assessment**

Instructions: Complete the trigger assessment for every admission to the Medical ICU. Complete each section and then total the points. A score of 5 or greater, consider a palliative care specialist consultation or referral. A score of 8 or greater, consider family meeting within 48 hours. A score of 10 or greater, consider immediate goals of care discussion with family. Discuss with the medical team your findings.

| **Section 1: Diagnosis (2 points for each)** | |
|---|---|
| Diagnosis | Points |
| ESRD / Dialysis dependent renal disease / Need for acute dialysis | |
| COPD dependent on oxygen / COPD exacerbation requiring intubation | |
| Progressive or metastatic cancer | |
| Severe neurological injury from consideration of brain death testing, CVA, trauma, or hypoxic-ischemic brain injury (from status epilepticus or cardiac arrest) | |
| CHF / CHF exacerbation requiring intubated / CAD / Cardiomyopathy | |
| ESLD with encephalopathy or major bleeding episode | |
| Other life-limiting or serious progressive illness (ALS, Myasthenia gravis, uncontrolled DM, uncontrolled HTN, etc.) | |
| Readmission to ICU for the same diagnosis within 60 days | |
| **Section 2: Modifiers/Situation (1 point for each)** | |
| Modifiers and Situations | Points |
| Transplant or organ donation being considered | |
| Long term care device in place or placement being discussed (PEG tube, tracheostomy, AICD, or other devices) | |
| No advance directives | |
| Patient is already DNR, AND or DNI / patient or family rescinded previous goals of care decisions (DNR, DNI, DNH) | |
| Unrealistic or divergent family opinions about care and prognosis of patient | |
| Readmission or transfer to ICU within the same hospitalization | |
| Admission or transfer from a long-term care or sub-acute care facility | |
| Medical team and family unable to resolve conflicts regarding goals of care, prognosis, or any other issues | |
| **Section 3: Surprise Question (Yes = 0 points; No = 2 points)** | |
| Surprise Question | Points |
| Considering the previous sections and the patient, would you be surprised if the patient died in the next 12 months? Circle one: Yes or No | |
| **Total Score** | |
| Score ≥ **5** consider palliative care consultation or referral; Score ≥ **8** consider family meeting within 48 hours; Score ≥ **10** consider immediate goals of care discussion | |
| ESRD = End-stage renal disease; COPD = Chronic obstructive pulmonary disease; CVA = Cerebrovascular accident; CHF = Congestive heart failure; CAD = Coronary artery disease; ESLD = End-stage liver disease; ALS = Amyotrophic lateral sclerosis; DM = Diabetes mellitus; HTN = hypertension; ICU = Intensive care unit; PEG = percutaneous endoscopic gastrostomy; AICD = Automatic implantable cardioverter defibrillator; DNR = Do not resuscitate; AND = Allow natural death; DNI = Do not intubate; DNH = Do not hospitalize | |

V1 12.17.20

## Appendix F: Project Timeline

[redacted]

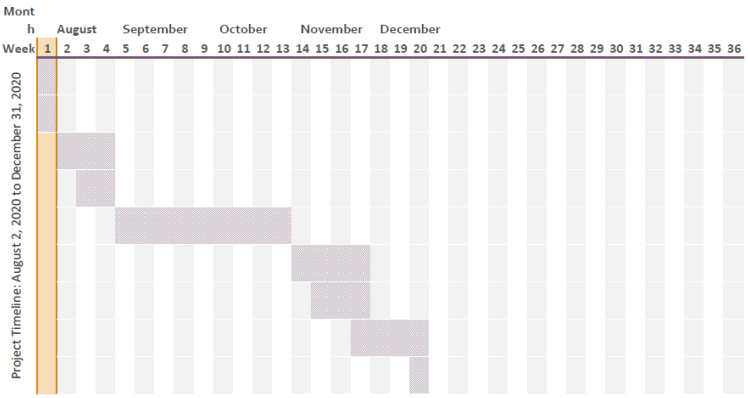
# Medical ICU Palliative Care Trigger Assessment

Rutgers University School of Nursing
Principal Investigator: Dr. Yin Chao, A.P.N.
Co-Investigator: Leonne James Ramiro, R.N., B.S.N.

*Intervention: Screening September 1, 2020 through October 31, 2020*

1 Plan Duration Actual Start % Complete Actual (beyond plan) % Complete (beyond plan

| ACTIVITY | PLAN START | PLAN DURATION | ACTUAL START | ACTUAL DURATION |
|---|---|---|---|---|
| IRB Approval | 1 | 1 | | |
| REDCap Access | 1 | 1 | | |
| Pre-Intervention Data Collection | 2 | 3 | | |
| Education of Nurses | 3 | 2 | | |
| Intervetion | 5 | 9 | | |
| Post-Intervetnion | 14 | 4 | | |
| Evaluation | 15 | 3 | | |
| Data Analysis | 17 | 4 | | |
| Presentation and Dissemination | 20 | 1 | | |



## Appendix G: Project Evaluation

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Name:
Date:

**Medical ICU Palliative Care Trigger Assessment**

**Evaluation Survey**

Thank you for participating in this DNP Project.

Please complete this evaluation survey.

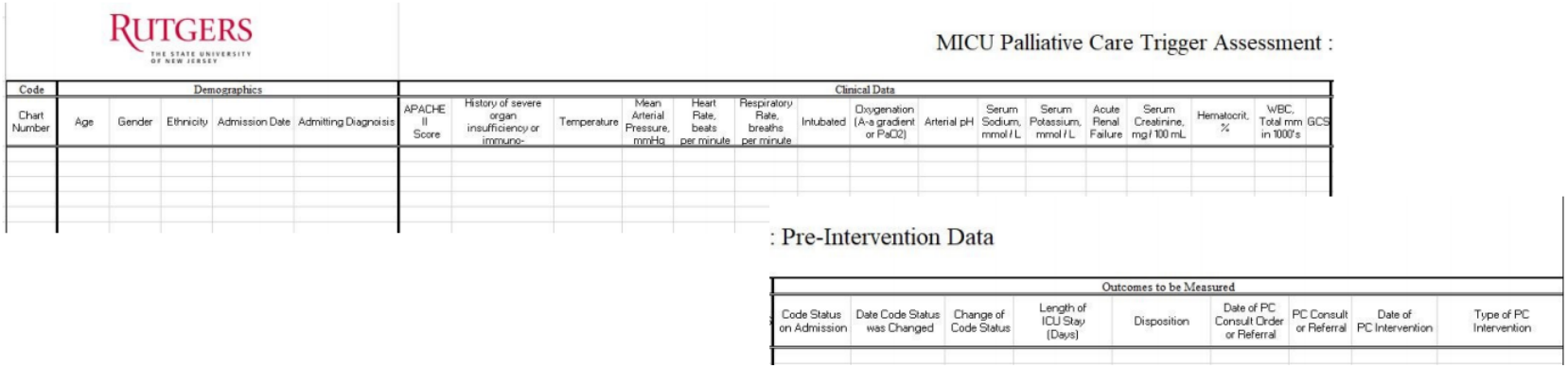
1. What are the successes and difficulties of the trigger assessment, its use, and the overall project?

2. Do you believe that the trigger assessment can be used in everyday practice? Why or why not?

3. If the trigger assessment was adopted as usual practice, what would you do to improve the overall process?

## Appendix H: Excel Data Extraction

**Figure 1: Patient Pre-intervention Data**



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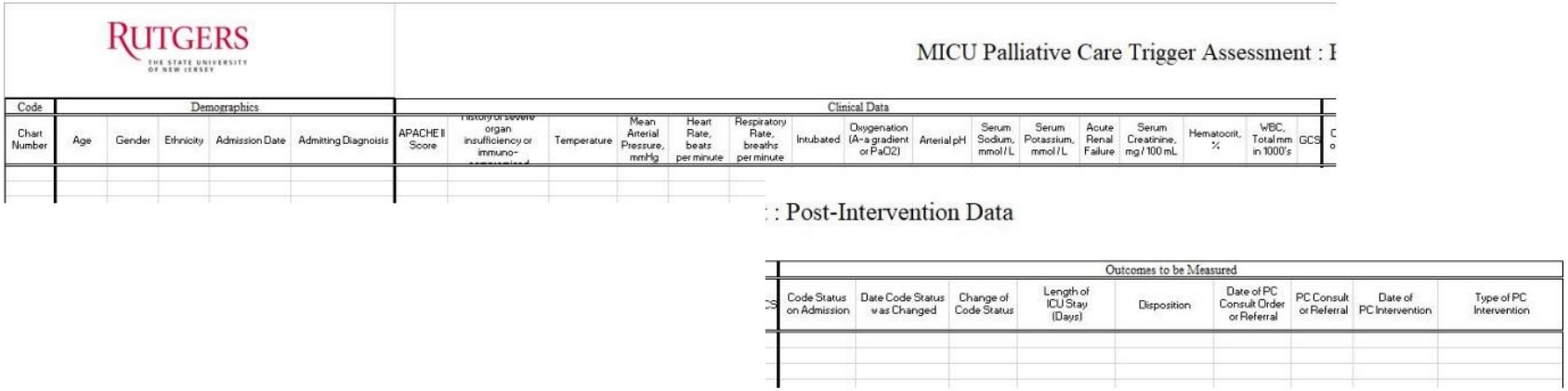
MICU Palliative Care Trigger Assessment :

| Code | Demographics | | | | | Clinical Data | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chart Number | Age | Gender | Ethnicity | Admission Date | Admitting Diagnosis | APACHE II Score | History of severe organ insufficiency or immuno- | Temperature | Mean Arterial Pressure, mmHg | Heart Rate, beats per minute | Respiratory Rate, breaths per minute | Intubated | Oxygenation (A-a gradient or PaO2) | Arterial pH | Serum Sodium, mmol / L | Serum Potassium, mmol / L | Acute Renal Failure | Serum Creatinine, mg / 100 mL | Hematocrit, % | WBC, Total mm in 1000's | GCS |
| | | | | | | | | | | | | | | | | | | | | | | |

: Pre-Intervention Data

| Outcomes to be Measured | | | | | | | |
|---|---|---|---|---|---|---|---|
| Code Status on Admission | Date Code Status was Changed | Change of Code Status | Length of ICU Stay (Days) | Disposition | Date of PC Consult Order or Referral | PC Consult or Referral | Date of PC Intervention | Type of PC Intervention |
| | | | | | | | | |

**Figure 2: Patient Post-intervention Data**



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MICU Palliative Care Trigger Assessment : I

| Code | Demographics | | | | | Clinical Data | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chart Number | Age | Gender | Ethnicity | Admission Date | Admitting Diagnosis | APACHE II Score | History of severe organ insufficiency or immuno- | Temperature | Mean Arterial Pressure, mmHg | Heart Rate, beats per minute | Respiratory Rate, breaths per minute | Intubated | Oxygenation (A-a gradient or PaO2) | Arterial pH | Serum Sodium, mmol / L | Serum Potassium, mmol / L | Acute Renal Failure | Serum Creatinine, mg / 100 mL | Hematocrit, % | WBC, Total mm in 1000's | GCS | C o |
| | | | | | | | | | | | | | | | | | | | | | | |

: Post-Intervention Data

| Outcomes to be Measured | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Code Status on Admission | Date Code Status was Changed | Change of Code Status | Length of ICU Stay (Days) | Disposition | Date of PC Consult Order or Referral | PC Consult or Referral | Date of PC Intervention | Type of PC Intervention |
| | | | | | | | | |

**Figure 3: Nurses Data**

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MICU Palliative Care Trigger Assessment Project

| Nurses - Pre-Intervention | | | | | | | | | | Nurses - Post-Intervention | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Demographics | | | | | Survey Questions | | | | Survey Questions | | | |
| Nurse Number | Age | Gender | Years of Nursing | Years of ICU | Highest Education | Question 1 | Question 2 | Question 3 | Question 4 | Question 1 | Question 2 | Question 3 | Question 4 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |