

Southern California CSU DNP Consortium

California State University, Fullerton
California State University, Long Beach
California State University, Los Angeles

SEPSIS EARLY IDENTIFICATION MEASURES IN LONG-TERM CARE

A DOCTORAL PROJECT

Submitted in Partial Fulfillment of the Requirements

For the degree of

DOCTOR OF NURSING PRACTICE

By


Nohely Y. Macias

Doctoral Project Committee Approval:

AJ Jadalla, PhD, RN, Team Leader
Khalil Kholoud, PhD, RN, Team Member

May 2023

Author Note

Nohely Macias -  <https://orcid.org/0000-0001-5063-7569>
DOI 10.5281/zenodo.10548054
© 2023 Nohely Macias

ABSTRACT

Background: Individuals with intellectual disabilities (IDD) living in residential facilities are particularly vulnerable and at higher risk for developing sepsis. In the three participating Adult Residential Facilities for Persons with Special Health Needs (ARFPSHN) homes, approximately 48% of all unplanned hospitalizations (UPH) are attributed to sepsis, 28% of all UPHs are attributed to Pneumonia, and 24% to Urinary Tract Infections (UTI). The lack of early sepsis identification measures in residential facilities delays the recognition of acute illness, which results in delays in higher acuity levels of care, contributing to a higher rate of unplanned hospitalization incidents. Aim: To implement early sepsis-identification measures in the ARFPSHN homes to decrease potentially avoidable hospitalizations (PAH) rates. Method: A translation of evidence with pre-and-post intervention to evaluate early sepsis identification measures in three ARFPSHN homes in Southern California. Implementing the Stop and Watch Early Warning tool by direct support professionals (DSP) and the SBAR Communication tool by the licensed professional as measures for the early recognition of changes in conditions and improved communication among healthcare workers (HCWs). The histogram chart was used for the pre-and-post-intervention frequency analysis, and a case-by-case analysis of the PAH and measures implementation was conducted. Results: The Stop and Watch and SBAR tools were used in 50% of all eight PAHs. The measures were also implemented on four other occasions for residents' changes in conditions that did not result in PAH or emergency visits without hospitalizations. Conclusion: When the measures were used appropriately, prompt identification and reporting of residents' subtle changes in conditions, effective communication among the HCWs, and enhanced residents' health care planning were demonstrated.

Keywords: Interact, sepsis, early identification, intellectual disabilities, developmental disabilities, long-term care, sepsis tools, infection prevention.

TABLE OF CONTENTS

ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	vii
BACKGROUND	1
Problem Statement.....	3
Purpose Statement.....	4
Supporting Framework	5
IOWA Model	5
REVIEW OF LITERATURE	9
Search Strategies.....	10
Sepsis Cost and Prevalence.....	11
Sepsis Morbidity and Mortality	11
Quality of Life and Functional Disability.....	12
Early Sepsis Identification Tools	13
Summary of Literature Review.....	16
METHODS	18
Design	18
Setting	18
Participants.....	19
Ethical Issues	20
Project Implementation.....	20
Stakeholders Support	20
Resources, Constraints, and Approvals	20
Timeline, Materials, and Select Champion.....	21
Develop and Implement Training Plan.....	21
Implementation of the Tool	22
Data Collection	23
Data Analysis.....	25
RESULTS	26
Sample Demographics	26

Medical Characteristics.....	26
Potentially Avoidable Hospitalizations and Emergency Department Visits	27
DISCUSSION.....	30
Limitations	31
Implications.....	32
Conclusions.....	32
REFERENCES	34
APPENDIX A: Title 17 Incident Type Counts Per Quarter	41
APPENDIX B: Revised Iowa Model of Evidence-Based Practice to Promote Quality of Care ...	42
APPENDIX C: Iowa Model Permission.....	43
APPENDIX D: Iowa Model – Early Sepsis Identification Tool in Residential Facilities.....	44
APPENDIX E: Figure 1: Interact Model 4.5 Stop and Watch Early Warning Tool	45
Figure 2: Interact Model 4.5 SBAR Communication Form	46
APPENDIX F: IRB Approval.....	50
APPENDIX G: Letter of Support from Organization for Project Implementation	51
APPENDIX H: Pathway Health Educational License for Assisted Living.....	52
APPENDIX I: Pathway Health Educational License for Skilled Nursing	57
APPENDIX J: Project Timeline	62
APPENDIX K: Work Flowchart	63
APPENDIX L: Figure 1: Interact Model 4.5 Acute Care Transfer Log.....	64
Figure 2: Interact Model 4.5 Quality Improvement Tool for Review of Acute Care Transfers.....	65
APPENDIX M: Table 1: Pre-Intervention Data of Potentially Avoidable Hospitalizations & Emergency Department Visits Without Hospitalization Rates.....	69
Table 2: Post-Intervention Data of Potentially Avoidable Hospitalizations & Emergency Department Visits Without Hospitalization Rates.....	70
APPENDIX N: Table 1: Residents Demographics.....	71
Table 2: Medical Characteristics	72

APPENDIX O: Histogram Chart for Pre-and-Post Implementation Data for Potentially Avoidable Hospitalizations.....	73
APPENDIX P: Histogram Chart for Pre-and-Post Implementation Data for Emergency Department Visits Without Hospitalization.....	74
APPENDIX Q: Case-by-Case Analysis of Potentially Avoidable Hospitalizations, Emergency Department Visits, and Changes in Condition per participating facility	75

ACKNOWLEDGEMENTS

I am thankful for the support and guidance received from my professors and mentors at California State University Long Beach (CSULB), Fullerton (CSUF), and Los Angeles (CSULA). I would like to recognize Dr. Jadalla for her guidance, encouragement, and mentorship provided while completing the Doctor of Nursing Practice project. I appreciate my colleagues from DNP cohort X; their friendship and encouragement were invaluable. I am deeply grateful for my family's unwavering support and patience during my educational journey, it has been challenging, but I could not have made it without my husband's and kids' love and support. This achievement is for Diego and Mia because they are my most powerful motivation to continue to pursue my educational goals. Lastly, I want to thank my mother and sisters; their courage and unconditional love inspired me to continue my higher education and lead a meaningful life.

Background

Sepsis is a life-threatening medical emergency that affects 1.7 million adults annually in the U.S. (Centers for Disease Control and Prevention [CDC], 2021b). According to the most recent statistics, approximately 270,000 Americans die of sepsis annually (U.S. Department of Health and Human Services, 2021). Although sepsis does not discriminate, those at higher risk for sepsis are older adults, survivors of sepsis, weakened immune systems or recent hospitalization, and individuals with underlying medical conditions (U.S. Department of Health and Human Services, 2021).

Approximately one million individuals are served in more than 15,000 long-term care facilities (AHQR, 2017) in the U.S. These facilities serve individuals with needs, such as those who require assistance with activities of daily living, elderly individuals and/or services for persons with intellectual and developmental disabilities (California Association of Health Facilities, 2021). According to the CDC (2019), approximately 6.5 million individuals in the U.S. have intellectual and developmental disabilities. Individuals served in long-term care facilities are at increased risk for infections due to a weakened immune system and chronic conditions (AHRQ, 2017). According to Reyes et al. (2018), sepsis is the most common admitting diagnosis for individuals served in long-term care, and its progression is often subtle and rapid. Individuals served in nursing homes account for 25% of sepsis hospital admissions, have a higher rate of intensive care unit (ICU) admissions, and increased hospital stays (Mylotte, 2020).

Up to 60% of those who survive sepsis and septic shock experience cognitive and physical limitations, and those of older age experience, on average, one to two limitations in their activities of daily living (Durning, 2020). Studies have found that individuals with disabilities are

more likely to experience unmet healthcare needs and are at risk of not receiving preventive care services needed for disease prevention (U.S. Department of Health and Human Services, 2020).

The Agency for Healthcare Research and Quality (AHRQ, 2020) conducted a study that showed that between 2000-2009 the number of hospitalizations with a primary diagnosis of sepsis in the U.S. increased by 148% and sepsis as a secondary diagnosis by 66%. In 2013, the cost of sepsis in the healthcare system accounted for more than \$24 billion in U.S. hospital expenses, ranking among the highest in-hospital admission cost (Paoli et al., 2018). Sepsis management continues to be a challenge in the healthcare system, creating a financial burden and impacting the health of the American people (Paoli et al., 2018). Nearly 87% of sepsis cases develop outside the hospital setting; therefore, early identification is imperative for improving the morbidity and mortality of individuals served in the non-acute care setting (CDC, 2021b).

Individuals with intellectual and developmental disabilities are at higher risk of sepsis. Contributing factors are poorer health than those without disabilities, a lower life expectancy, and limited access to adequate healthcare (Sepsis Alliance Institute, 2022). This population also experiences communication and cognitive barriers with those caring for them, affecting the prompt identification of acute changes and the start of treatment. In the United States, septicemia and respiratory tract infections are the leading causes of ED visits, hospitalization, and mortality rate for this population (Zandam et al., 2022).

According to the U.S. Department of Health and Human Services (2020), individuals with developmental disabilities who live in a congregate-care facility with seven or more residents are at higher risk for poor patient outcomes and substandard quality of care. In 2005, Senate Bill 962 proposed a pilot project to develop certified residential programs for adults with developmental disabilities who are medically fragile and require nursing support 24/7 (Center for

Human Services University of California Davis, 2010). The Center for Human Services University of California Davis (2010) implemented a pilot study to evaluate the effectiveness of the specialized community-based care home in addressing consumers' health care and intensive support needs. The pilot study showed that the community-based care homes named Adult Residential Facilities for Persons with Special Health Needs (ARFPSHN) were successful. The residents supported in the ARFPSHN homes received a higher quality of care and appropriate access to health services than those served in congregate settings (Center for Human Services University of California Davis, 2010).

Although residents in the ARFPSHN homes receive a higher quality of care, the rate of unplanned hospitalizations continues to be the highest and most consistent incident reported by the ARFPSHN providers in California. In 2021, the quarterly incidents of unplanned hospitalizations reported by ARFPSHN in California ranged between 61% and 75%. Similarly, in 2022, these incidents ranged between 74% and 75% (Appendix A).

Problem Statement

Sepsis is a significant factor in unplanned hospitalizations for the residents supported in the ARFPSHNs. The lack of a standardized sepsis identification tool in long-term care facilities affects the prompt identification of acute illness and the need for a higher acuity level of care (Durning, 2020). According to Reyes et al. (2018), identifying sepsis early ensures timely treatment implementation, reducing the disease progression and improving patient outcomes and a lower mortality rate. While several sepsis-screening tools are available in healthcare settings, only some might be useful in long-term facilities. The need for a gold standard for sepsis identification in this healthcare setting precludes the ability to develop a highly sensitive screening tool (Mylotte, 2020). In October and November 2021, the statistics for all the

ARFPSHN homes from the non-profit organization associated with this project showed that 66% of the unplanned hospitalizations were due to internal infection, and 34% were related to respiratory illness/infections. December 2021 showed that 50% of unplanned hospitalizations were related to respiratory illness, and the data in the first quarter of 2022 showed similar rates.

Some of the available tools that improve recognition of clinical sepsis deterioration are Septic Related Organ Failure Assessment (SOFA), National Early Warning Score (NEWS), and Systemic Inflammatory Response Syndrome (SIRS). These tools typically include laboratory data to identify the risk for sepsis. The capability for rapid laboratory tests, diagnostic tests, and physicians onsite is not feasible or readily available in long-term care. Implementing a more practical identification tool in the non-acute setting is imperative for early sepsis detection and treatment. The quick SOFA (qSOFA) is simplified and was developed for implementation in a long-term care setting (Mylotte, 2020). According to Reyes et al. (2018), qSOFA could fail to identify sepsis in the individuals served in long-term care due to their atypical presentation of an acute illness or falsely identify sepsis with other disease processes common in this population. The Interventions to Reduce Acute Care Transfers (INTERACT) program focuses on identifying early changes in conditions for high-risk residents in long-term care. The effective implementation of INTERACT decreases unnecessary hospitalizations and promotes the early identification associated with the early stages of acute illness (Reyes et al., 2018).

Purpose Statement

The project aimed to implement early sepsis identification measures applicable to the Adult Residential Facilities for Persons with Special Health Needs (ARFPSHN). The project's overarching goal was to institute measures for promptly identifying changes in condition to decrease the potentially avoidable hospitalizations (PAH) and emergency department (ED) visits

without hospitalization rates. Pre-and-post-intervention data was analyzed to identify the application of the measures and the correlation with potentially avoidable hospitalization (PAH) and Emergency Department Visits (EDV) without hospitalization rates.

Supporting Framework

Implementing evidence-based practice (EBP) in healthcare incorporates valid and reliable data to make decisions for patient care (Doody & Doody, 2011). Various practical models are available for clinicians to guide EBP projects. Most models emphasize clinical applications in various healthcare settings (Polit & Beck, 2021). The Iowa Model of Evidence-Based Practice to Promote Excellence in Health Care (Appendix B) is a pragmatic model that guides the application of EBP with a focus on problem-solving and team collaboration (Grove & Gray, 2019). Approval permission was obtained to review or reproduce the Iowa model for this project, shown in Appendix C.

IOWA Model

The Iowa Model (IM) was first developed in 1994 by a team of nurses from the University of Iowa Hospitals and Clinics (UIHC) and the College of Nursing (Titler et al., 1994). The model was developed on the founding premises of the Diffusion of Innovations Theory by Rogers (1983) and the Quality Assurance Model Using Research (Watson et al., 1987). Since its development, the IM has endured the test of time and is continually referenced by clinicians, educators, and researchers from all 50 states in the U.S. and 130 countries worldwide (Buckwalter et al., 2017). The IM was last revised in 2017 to demonstrate adaptation to translation research and patient engagement (Buckwalter et al., 2017). The IM is an application-oriented guide for EBP change, proven highly effective and sustainable (Buckwalter et al.,

2017). The author used a modified Iowa model and tailored the steps to give guidance and structure to this project (Appendix D).

The IOWA model consists of seven steps and three decisional points. While the steps are organized in a progressive order, the steps are iterative and flexible, allowing evolving contexts or evidence to be incorporated during the EBP translation process. The steps are detailed below, including a brief description of how they were applied in this project.

The first step of the IM involves identifying the triggering issues or opportunities for EBP change. When selecting a topic, it was essential to consider the magnitude, need, and priority of the problem (Doody, C. & Doody, O., 2011). The statewide reports by the Office of Quality Assurance and Risk Management (OQARM) confirmed that unplanned hospitalizations were the highest and most consistent incident type reported by all ARFPSHN providers in California. The clinical problem identified was the high prevalence of unplanned hospitalizations related to infections in the ARFPSHN homes.

The second step of the IM requires formulating the question or the purpose statement. Clinicians may use the PICO mnemonic for P: population, I: intervention, C: comparison, and O: outcome to develop a well-constructed question (Polit & Beck, 2021). The purpose statement follows a similar format for a foreground question, including population, setting, intervention, and outcome. This DNP project aimed to implement an early sepsis identification tool tailored for individuals with developmental disabilities residing in ARFPSHN homes. The overarching goal was to decrease PAH rates, improving patient outcomes through early detection of deteriorations preceding sepsis.

A decision point follows the second step in the IM. A decision point indicates that input should be sought before moving forward. At this first decisional point in the current project, the

topic for EBP change was evaluated to ascertain whether it was a priority for the residential facilities and whether key stakeholders would support moving forward. The OQARM quarterly reports from October 1, 2019, to September 30, 2021, at the ARFPSHN facilities involved in this project, indicated that unplanned hospitalization related to infections accounted for the highest incident type reported by providers per quarter, which corralled leadership support for implementing this project. Overall, the unplanned hospitalization baseline data from April 2021 to September 2022 indicated that almost half of all hospitalizations were due to sepsis, 28% were related to respiratory infections, and 24% to internal infections.

The third step of the IM involves forming a team to develop, implement, and evaluate the project outcomes. The team was formed by the EBP's project leader, Program Administrator for the ARFPSHN homes, licensed professionals such as registered nurses, vocational nurses, psychiatrist technicians, and non-licensed staff working for these residential facilities. Licensed staff members were selected as the change champions to assist with practice change efforts, proper implementation of the tool, and serve as a resource. Encouraging the participation of healthcare workers has long been identified as a factor that enhances true collaboration and promotes the success of EBP changes (Gough, 2001; Doody C. & Doody O., 2011).

The fourth step of the IM involves assembling, appraising, and synthesizing the body of evidence. The studies are critically appraised, weighing quality, quantity, and consistency (Buckwalter et al., 2017). This project's team leader retrieved relevant evidence sources using electronic databases such as CINAHL, Cochrane Library, PubMed, and EBSCO. According to Doody & Doddy (2011), incorporating a review protocol and grading criteria offers guidance in appraising the body of evidence's quality, consistency, and applicability. The Preferred Reporting Items for Systemic Reviews and Meta-Analysis (PRISMA) tool was used to appraise

the systemic reviews and meta-analysis included in the evidence. The PRISMA statement allows researchers to appraise systemic reviews and meta-analyses for trustworthiness and applicability, facilitating transparency and accuracy of the findings (Page et al., 2021). Relevant studies were identified, appraised, and then organized in a table of evidence that facilitated appraising the quantity, quality, and consistency of the body of evidence.

The fourth step of the IM is followed by a decision point to determine whether a body of evidence is substantial, rigorous, and consistent and thus supports the planned practice change. The body of evidence in the literature review demonstrated sufficient and consistent findings supporting the implementation of early sepsis identification tools.

The fifth step of the IM involves designing and piloting the practice change in the healthcare setting with the team's support. Key to the success in this step is securing leadership and staff support to promote the feasibility of the pilot change (Buckwalter et al., 2017). A plan was developed with the team to implement the INTERACT Stop and Watch Tool and the SBAR communication tool for the assessment of adults with developmental disabilities served in the ARFPSHN homes. Baseline data were collected for hospitalization and ED visit rates for the ARFPSHN homes participating in the project. Pre-and post-data were analyzed to compare the rates of unplanned hospitalizations and ED visits without hospitalizations.

A decision point follows the fifth step of the IM. A decision is reached when the team members are asked to evaluate the pilot practice change for applicability, feasibility, and appropriateness. If the team members agree that the undertaken change is applicable, feasible, and appropriate, the team moves to the sixth step, which focuses on the integration phase. The project implementation and evaluation are discussed in detail in the methods and results section. The team leader presented the findings of the pilot change to the Executive Director (ED) and

Regional Director of the non-profit organization for approval for its statewide integration in the ARFPSHN homes.

The last step in the IM involves disseminating the findings and the lessons learned from the practice implementation within a setting to facilitate the external diffusion of evidence and replication to other similar settings.

Review of Literature

Search Strategies

The project leader conducted the literature searches with assistance from a specialized Nursing librarian specialist. A comprehensive literature review was conducted using PubMed, CINAHL, Cochrane, and EBSCO databases. The MeSH and key terms used in various combinations included “sepsis,” “severe sepsis,” “infection rate in adults,” “INTERACT,” “sepsis tools,” “early identification,” “tools,” “high infection rate,” “long-term care facilities,” “infection,” “diagnosis,” and “infection prevention.” Date delimitations were set that excluded literature published before 2014. Relevant studies published between 2014 and 2022 were included. Because sepsis tools and best practices change over time, only one quality improvement study conducted in 2011 by Ouslander et al. was included as an exception to the time limits in the search. The inclusion criteria were studies conducted in long-term care settings and for the adult population. In addition, gray literature and the references of selected articles were reviewed to obtain additional studies that met the inclusion criteria for the literature review. Exclusion criteria included studies conducted in the acute care setting or with the pediatric population and studies not published in English. Duplicates were also eliminated when studies were reviewed for inclusion.

A systemic approach was incorporated for the literature review. The articles’ titles and abstracts were reviewed for inclusion and exclusion criteria. The studies search yielded seventeen articles that were eligible for the literature review. The articles included one meta-analysis, four quality improvement reports, one randomized control trial, five expert opinions, four retrospective cohort studies, and two descriptive qualitative studies.

Sepsis Cost and Prevalence

Sepsis is a life-threatening and overwhelming response to infections that can lead to tissue damage, organ failure, and death (CDC, 2021b). Sepsis creates a financial burden on the U.S. healthcare system costing \$24 billion annually (Paoli et al., 2018; Porter et al., 2021; U.S. Department of Health and Human Services, 2018). Sepsis hospital utilization, length of hospital stays, and higher acuity care have risen yearly (Sloane et al., 2018; Paoli et al., 2018; Porter et al., 2021). Although sepsis can affect anyone, those who are immune-compromised and/or elderly have an elevated risk of developing sepsis, especially with prolonged hospitalizations and complications (Durning, 2020; Mihaljevic; & Howard, 2016; Porter et al., 2021; Sloane et al., 2018).

Of sepsis cases, 87% begin in the community, and individuals living in LTCFs have a higher risk than their counterparts not residing in long-term care settings (Durning, 2020; Yoshikawa et al., 2019). Individuals who survive sepsis are prone to re-hospitalizations within 30 to 90 days of the first sepsis diagnosis due to a repeat incident of sepsis or active infection (Durning, 2020; Ouslander et al., 2011; Paoli et al., 2018). Sepsis impacts the morbidity and mortality of Americans and causes lasting detrimental effects in sepsis survivors (Carey et al., 2020).

Sepsis Morbidity & Mortality

According to the CDC (2012), morbidity is a change in physiological and psychological well-being related to a specific disease or illness. Mortality is the number of deaths related to a specific disease or illness during a specified interval (CDC, 2012). Sepsis is the 10th leading cause of death in the U.S. (CDC, 2021b), with age and comorbidities significantly contributing to post-sepsis mortality (Shankar-Hari et al., 2016).

In the U.S., approximately 1.6 to 3.8 million infectious diseases affect individuals living in LTCFs annually, accounting for 26% to 50% of patients' hospital transfers (Richards, 2020). The overall burden of sepsis in LTCFs is substantial and contributes to the morbidity and mortality of individuals in this type of setting (Mihaljevic & Howard, 2016; Porter et al., 2021; Sloane et al., 2018). Individuals with sepsis have a 28.6% mortality rate of 40% up to 80% if severe sepsis or shock is present, depending on age and comorbidities (Mihaljevic & Howard, 2016; Paoli et al., 2018). Sepsis is not only a fatal threat but also negatively affects the functionality and quality of life of sepsis survivors.

Quality of Life & Functional Disability

Quality of life is a multidimensional concept personified by life's positive and negative aspects (CDC, 2021a). Health-related quality of life focuses on the impact of an individual's health on various domains, including physical, mental, emotional, and social (CDC, 2021a). Functional disability is a condition that affects any condition of the body or mind causing limitations (CDC, 2020).

Sepsis is associated with impaired quality of life, functional decline, and worsening cognitive impairment (Carey et al., 2020; Durning, 2020; Shankar-Hari et al., 2016; Sloane et al., 2018). Despite mixed results in the literature findings show that sepsis is associated with initial reductions in health-related quality of life and lasting functional disability (Carey et al., 2020; Yoshikawa et al., 2019). It is worth noting that sepsis survivors adapt to their disability with resilience and coping mechanisms that improve their perception of health (Carey et al., 2020; Durning, 2020; Shankar-Hari et al., 2016).

The elevated risk of sepsis mortality and morbidity among patients in LTCFs indicates the need for instituting prevention and early detection measures to facilitate early interventions to

curb its negative consequences for residents in LTCFs. Early sepsis identification tools decrease morbidity and mortality (Mihaljevic & Howard, 2016; Huckfeldt et al., 2018; Sloane et al., 2018; Porter et al., 2021).

Early Sepsis Identification Tools

Sepsis is the most common admitting diagnosis for patients coming from SNF (Ouslander et al., 2014; Reyes et al., 2018; Sloane et al., 2018). Sepsis is a syndrome that encompasses uncertain pathobiology, which challenges the creation of one gold standard diagnostic test (Mylotte, 2020; Singer et al., 2016). Several screening tools are available for early sepsis identification in the healthcare system.

Early identification of sepsis is critical for patients' positive outcomes (Durning, 2020; Mihaljevic & Howard, 2016; Paoli et al., 2018; Porter et al., 2021). The introduction of screening tools has improved the care of patients with sepsis; however, these tools still have limitations. Overall, current studies show that the sepsis screening tools have low sensitivity and specificity for the residents in LTCF due to the atypical clinical manifestations of sepsis in this population (Reyes et al., 2018; Yoshikawa et al., 2019). Screening tools incorporating laboratory data for the identification criteria limit their use in long-term care facilities (Reyes et al., 2018). There is a lack of quantitative studies incorporating sepsis screening tools in LTCFs, impacting the credibility of their implementation by clinicians working in this setting (Reyes et al., 2018; Ouslander et al., 2011; Huckfeldt et al., 2018).

Systemic Inflammatory Response Syndrome (SIRS) and Sequential Organ Failure Assessment (SOFA) are sepsis-screening tools used to assess patients' mortality risk (Reyes et al., 2018). The SIRS focuses on the inflammatory response rather than the organ dysfunction (Sloane et al., 2018; Yoshikawa et al., 2019). SIRS criteria require the presence of suspected

infection and abnormal parameters that are not often present in individuals with weak immune systems (Yoshikawa et al., 2019). In 2016 the European Society of Intensive Care Medicine and the Society of Critical Care Medicine convened a task force to reexamine the definition of sepsis (Singer et al., 2016). With the update of the definition of sepsis, the consensus committee eliminated the SIRS criteria due to its poor concurrent validity (Mylotte, 2020; Singer et al., 2016).

The SOFA is a diagnostic criterion used to identify those at risk for sepsis (Sloane et al., 2018; Yoshikawa et al., 2019). The SOFA determines the level of organ dysfunction and mortality risk in patients admitted to the intensive care unit (Singer et al., 2016). Some blood tests needed for the SOFA screening are bilirubin level, platelet count, and creatinine level. Glasgow Coma Scale, the fraction of inspired air (FiO₂), and mean arterial pressure (MAP) are also part of the criteria for SOFA (Singer et al., 2016). The quick SOFA (qSOFA) provides a more practical approach that does not require laboratory tests and provides simple bedside criteria (Singer et al., 2016). However, its implementation outside the critical care community is not well established (Singer et al., 2016; Sloane et al., 2018). The qSOFA criteria fail to consider the baseline cognitive changes in those with weaker immune systems and multiple comorbidities (Mylotte, 2020; Sloane et al., 2018).

Minnesota Hospital Association developed the 100-100-100 criteria (3-100s) screening tool to identify patient health status changes (Sloane et al., 2018; Yoshikawa et al., 2019). The 3-100s criteria tool is a more feasible and practical instrument, but its specificity only reaches 79% within 12 hours before hospital transfer (Reyes et al., 2018; Sloane et al., 2018; Yoshikawa et al., 2019). Its simplicity makes it user-friendly, but there are no published studies to verify its specificity and sensitivity in the individuals served in LTC (Mylotte, 2020; Reyes et al., 2018).

The Modified Early Warning Sign (MEWS) tool incorporates criteria from all three tools, the 3-100s, SIRS, and qSOFA criteria, into one comprehensive tool. However, research on implementing MEWS outside the acute care setting is limited (Brangan et al., 2018).

The Intervention to Reduce Acute Care Transfers (INTERACT) is a quality improvement program that focuses on the recognition of the early stages of acute illness for individuals in LTC settings (Huckfeldt et al., 2018; Mylotte, 2020; Ouslander et al., 2014; Reyes et al., 2018). The INTERACT program has a set of tools addressing risk factors leading to potentially avoidable hospitalization (Huckfeldt et al., 2018; Porter et al., 2021; Reyes et al., 2018). The Stop and Watch Early Warning Tool (Appendix E, Figure 1) is one of the tools from the INTERACT program, which is used by unlicensed personnel to identify subtle cognitive changes in high-risk individuals (Porter et al., 2021; Sloane et al., 2018). INTERACT has three core strategies: recognition, communication, and enhanced care planning (Huckfeldt et al., 2018; Mihaljevic & Howard, 2016; Porter et al., 2021).

The most common limitation of the INTERACT program is the partial implementation of the INTERACT program in the LTCFs, as only some of the tools are implemented. Therefore, fidelity to the original program is somewhat of a concern questioning the program's validity and generalizability to this population (Huckfeldt et al., 2018; Kane et al., 2017; Porter et al., 2021; Sloane et al., 2018). Despite this limitation, the INTERACT program is associated with an 11.2 - 24% reduction in all-cause hospitalizations and 18.9% in potentially avoidable hospitalizations (Huckfeldt et al., 2018; Ouslander et al., 2011; Ouslander et al., 2014). The INTERACT program promotes the prompt identification of changes in condition, thus improving the overall safety, efficiency, and effective care for the residents served in LTCFs (Mihaljevic & Howard, 2016; Porter et al., 2021).

Summary of Literature Review

The literature review indicates the need for early recognition of sepsis to promote positive patient outcomes and reduce preventable hospitalization costs (Huckfeldt et al., 2018; Kane et al., 2017). Long-term care facilities face many barriers in implementing early identification tools and programs, such as stakeholders' resistance, scarce resources, and competing demands (Kane et al., 2017; Tappen et al., 2017). The absence of onsite physicians and Advanced Practice Registered Nurses (APRNs) further compromises the timely treatment response to sepsis (Slone et al., 2018; Porter et al., 2021).

The literature supports that a combination of facilitating strategies results in greater compliance and better patient outcome (Tappen et al., 2017). Facilitators such as persistence and oversight, organization-wide involvement, and adequate training are critical for the successful implementation of change (Tappen et al., 2017). Various sepsis tools are available; however, more in-depth studies are needed to test the efficacy of the screening tools and tailor them for use in long-term care facilities (Huckerfeldt et al., 2018; Kane et al., 2017; Sloane et al., 2018).

Studies documented the negative impact of the economic and iatrogenic cost of preventable hospitalizations (Huckerfeldt et al., 2018; Kane et al., 2017; Paoli et al., 2018; Tappen et al., 2017). The financial and human cost of sepsis to individuals in long-term care facilities is detrimental (Yoshikawa et al., 2019). The need to address this problem is crucial for cost-effectiveness and to lower mortality rates associated with sepsis in the aging population (Mylotte, 2020). A practical and successful approach to early sepsis identification will require educating a well-trained nursing staff to recognize signs of sepsis and implementing evidence-based practice screening tools in LTCFs (Porter et al., 2021; Sloane et al., 2018).

The literature review of the early sepsis identification tools available in long-term care settings indicated that implementing the INTERACT program was practical, feasible, and comprehensible. The INTERACT program incorporates practical tools for the early recognition of illness, improving communication among healthcare workers, and enhancing decision support and care planning (Kane et al , 2017). The Stop and Watch Early Warning tool recognizes changes in high-risk residents, which promotes early identification by direct care staff (Appendix E, Figure 1). The SBAR communication tool in the INTERACT program (Appendix E, Figure 2) promotes effective communication among healthcare workers ensuring proper response by the licensed staff and promoting improved care planning.

Methods

Design

This project involved the implementation of the Stop and Watch Early Warning Tool and SBAR Communication Tool for the early recognition of acute infection by healthcare workers to decrease the PAHs and ED visits without hospitalization for the ARFPSHN homes. PAH and ED visits without hospitalization were the outcome measures of interest compared in this project.

PAH is a medical condition that could have been treated in an outpatient setting to avoid unnecessary hospitalization (Segal et al., 2014).

Setting

Three ARFPSHNs in Southern California served as the project settings. These ARFPSHN provide 24-hour care and specialized intensive support in a home-like setting for up to five adults with intellectual and developmental disabilities in conjunction with a seizure disorder, autism, and/or cerebral palsy (Department of Developmental Services [DDS], 2021).

The staff of the ARFPSHN homes includes registered nurses (RN), licensed vocational nurses (LVN), psychiatrist technicians (PT), and direct support professionals (DSP). The program administrator is the individual responsible for managing and supervising the ARFPSHN homes for a minimum of 20 hours of onsite supervision.

The three ARFPSHN homes are located in Southern California. The ARFPSHN homes belong to a non-profit organization that aims to provide excellent and compassionate care and to improve the quality of life and health equity of the residents supported. The nursing leadership structure for the non-profit organization consists of the Executive Director (ED) and a Regional Director (RD). The ED oversees the functions of the ARFPSHN homes, Adult Residential

Facilities (ARF), and Enhanced Behavioral Support Homes (EBSH) in California. The RD manages the ARFPSHN, ARF, and EBSH in the Southern California Region.

Participants

Residents typically must meet specific criteria for admission into the ARFPSHN homes. The criteria include being an adult with developmental disabilities with special health needs that require intensive support (DDS, 2021). Developmental disability is defined as a disability that develops before 18 years old and is expected to continue (DDS, 2021). Intensive support needs mean that a resident requires assistance in performing activities of daily living such as dressing, bathing, eating, and others (DDS, 2021). Residents might have the following medical needs including, but not limited to, tracheostomy management and care; ileostomy, nephrostomy, or other surgical procedures care; special medication regimen via intravenous route, intramuscular route, or other routes; treatment for wounds including pressure injuries; palliative care; pain management; renal dialysis; and other special health needs (DDS, 2021). The ambulatory status varies among the residents, but most are non-ambulatory and non-verbal.

This project included a purposive sample of adult individuals with developmental disabilities residing in the three selected ARFPSHN homes. The inclusion criteria included ARFPSHN homes serving adult residents 21 years and older, providing 24-hour nursing care, having access to laboratories and pharmacy services, and providing nursing leadership support for the planned implementation. The exclusion criteria included ARFPSHN homes participating in quality improvement projects, individuals in the ARFPSHN homes who were receiving hospice care, or residents transferred to skilled nursing facilities during the implementation of the project.

Ethical Issues

This project was submitted to the Institutional Review Board (IRB) at California State University, Long Beach (CSULB) and received exempt review approval on August 16, 2022 (Appendix F; IRB ID number 22-278). The data were de-identified and aggregated to ensure provider and resident anonymity. The data were kept in a locked and secured database during the project's duration.

Project Implementation

Stakeholders Support

The OQARM monthly reports from April 2021 to September 2022 show that for the three participating ARFPSHNs, 48% of all unplanned hospitalizations had a Sepsis diagnosis, 28% were Pneumonia, and 24% were Urinary Tract infections. The statistics for unplanned hospitalizations related to infections were a significant problem for individuals residing in ARFPSHN and a priority for the organization's stakeholders. The project leader emailed the project's purpose, permission to access data, the timeline of the project implementation, and other details relevant to the project to the Regional Director of the non-profit organization. A virtual meeting with key stakeholders was scheduled on May 20, 2022, to further clarify any questions about the project implementation. As a result, the Regional Director of the non-profit organization provided a letter of support, granting permission for project implementation in four ARFPSHN homes; however, only three ARFPSHNs participated (Appendix G).

Resources, Constraints, and Approvals

The materials and resources were obtained from the Pathway Health organization, which holds the global training license with Florida Atlantic University for the Intervention to Reduce Acute Care Transfers (INTERACT) Quality Improvement Program. The project leader requested the educational license from Pathway Health for the INTERACT program, which includes access

to educational materials and tools. The official letter from Pathway Health granting the educational license for Pathway Health Educational License for Assisted Living and Pathway Health Educational License for Skilled Nursing is included in Appendix H & I.

Timeline, Materials, and Selection of Champion

A project timeline was developed to ensure productivity, time efficiency, and process transparency (Appendix J). The project leader was responsible for teaching the educational materials, PowerPoint presentation of the Stop and Watch Early Warning tool, and SBAR communication tool (Appendix E, Figures 1 & 2), provided free of charge to the ARFPSHN homes. The project leader collaborated with the registered nurses at the participating ARFPSHN homes, who were designated as the project's champions. The lead licensed staff members on the afternoon or night shift served as co-champions. The project leader worked closely with the champions and co-champions to facilitate the direct support professionals' compliance with the Stop and Watch tool implementation and licensed staff compliance with the SBAR tool administration. The project leader communicated weekly or biweekly via phone and/or email with the champions and co-champions. Incentives include providing pastries for the team members during the training dates for each home and during the monthly onsite checks.

Developing and Implementing Training

The training plan included a presentation by the project leader with materials obtained from Pathway Health organization focusing on using the Stop and Watch Early Warning tool and SBAR Communication tool. The project leader implemented two education modalities to promote greater engagement in the multigenerational workforce at the homes. The first educational modality included an approximately one-hour in-person PowerPoint presentation delivered by the project leader. The presentation incorporated simulation/practice scenarios of

condition changes tailored to the resident's medical needs at each ARFPSHN home. The activity was correctly simulated using the Stop and Watch Early Warning tool and SBAR Communication Tool. The project leader reviewed the tools completed by staff and debriefed with staff after the onsite training to ensure understanding and proper use of the tools. The in-person training sessions were offered at the three participating residential facilities. The training for ARFPSHN-A was conducted on September 15, 2022, ARFPSHN-B on September 20, 2020, and ARFPSHN-C on October 18, 2022. The onsite training dates varied according to the ARFPSHN team's availability.

The second modality was a physical copy of the PowerPoint presentation that remained available as a reference in the residential facility and the practice scenarios for the Stop and Watch tool and SBAR tool for those unable to attend any of the onsite training options. The home champion provided the training material to employees who could not participate in the onsite training. For ARFPSHN-A and B, only two staff from each were unable to participate in the onsite training, and for ARFPSHN-C, six staff could not participate in the onsite training. All employees completed practice scenarios for the Stop and Watch tool. Licensed employees completed the SBAR communication tool with the practice scenarios. The project leader reviewed all completed tools to ensure understanding and appropriate application.

Implementation of the Tool

The tools were implemented in the ARFPSHN homes after the onsite training was conducted at the three participating residential facilities: ARFPSHN-A From September 16 to December 31 ARFPSHN-B From September 21 to December 31; and ARFPSHN-C From October 19 to December 31. The project leader worked closely with the ARFPSHN staff and champion to promote the proper implementation of the tool, training support, and tool auditing.

Biweekly checks (virtual/phone/email) occurred with champions and co-champions for each ARFPSHN home to address any barriers to the tool implementation. The communication took place by phone calls and/or emails depending on the champions and co-champions preferences and availability. Although biweekly checks were implemented with the three ARFPSHNs, there were occasions where no or a delayed response was received from the champion and co-champion.

The Stop and Watch tool and SBAR Communication Tool were transcribed in a paper format resembling the ARFPSHN homes' current clinical record-keeping method. A binder was formatted to include copies of the Stop and Watch tool and SBAR tool, a workflow flowchart (Appendix K) with implementation guidance, training material, and practice scenarios. The binder was located in a centralized and accessible location for the healthcare workers. The project leader monitored and evaluated the implementation of the tools in the ARFPSHN settings throughout the project's duration to promote intervention fidelity. When the project leader noticed any discrepancies in the tool implementation, such as missing critical data, incomplete tool, or incorrect tool use, reinforcement training was provided to the ARFPSHN homes during monthly onsite checks.

Data Collection

Baseline Data. The outcome data were collected monthly and quarterly by the OQARM using Power BI software. The OQARM categorizes the data collected in accordance with the California Code of Regulations, Title 17, 54327 Incident Reporting Requirements. Title 17 requires all ARFPSHN homes to report any unplanned hospitalization and ED visits to the monitoring agencies such as the California DDS, Department of Social Services, and Regional Centers.

The project leader collected baseline aggregated data from the monthly reports by the OQARM. Retrospective data analysis of the unplanned hospitalization and ED visit without hospitalization of the selected ARFPSHN homes was conducted to verify if the cause was related to infectious disease and/or sepsis. The baseline data consisted of 25 data points collected per event/incident date.

Post-Intervention Data. The incident dates of unplanned hospitalizations and ED visits without hospitalization were collected while implementing the Stop and Watch Early Warning Tool and SBAR communication tool. The project leader tracked the hospitalization rate and ED visits using the Acute Care Transfer Log (Appendix L Figure 1). The INTERACT Quality Improvement Review tool defined the root cause analyses on the hospitalizations and ED visits (Appendix L, figure 2). The extracted data for the unplanned hospitalizations and ED visits were compared to the hospital's ICD-10 code admission diagnosis to strengthen the data validity. Descriptive statistics were used to identify the PAH and ED visits by diagnoses and are presented in the result section (Appendix M, Table 1 & Table 2).

Characteristics of Residents. The project leader collected data on the demographic characteristics of the residents involved in the project (age, gender, and medical characteristics). The residents' demographics and medical characteristics are shown in Appendix N, Tables 1 & 2. Data were de-identified to protect residents' confidentiality and described in the results section.

Data Analysis

The histogram chart was used for comparing the frequency of pre-and-post data for the PAHs and ED visits without hospitalization per incident counts shown in Appendix O & Appendix P, respectively. In addition, a case-by-case analysis of the PAH, EDV, and changes in conditions was conducted to identify proper measures applicability and compare incidents' diagnoses with ICD-10 codes from the hospital's discharge documents. Although the analysis of the corrective action could not demonstrate a direct reduction in the PAHs, in this situation, the implementation of the tools improved the prompt identification of residents' changes in condition by the DSPs, improved effective communication between HCWs, and enhanced residents' healthcare planning. Twenty-five retrospective data points were analyzed for the pre-intervention/baseline phase. For the post-intervention, eight PAH data points were collected during the intervention period.

The project leader implemented a detailed review and evaluation of the Stop and Watch Early Warning Tool and SBAR application to ensure accuracy, data completeness, and proper tools usage throughout project implementation. The results section discusses the findings' details (Appendix Q).

Results

Sample Demographics

This project was a three-month translation of an evidence comparing pre-and post-implementation findings. Three ARFPSHN homes participated in this project, and data was collected on eleven residents. The gender distribution varied; most residents were female (64%, n=7) compared to their male (36%, n=4) counterparts. The average age of the residents was 51 years, ranging from 23 to 67 years. The data involved White (55%, n=6), Latino (27%, n=3), Asian (10%, n=1), and one unknown (10%, n=1) resident. All residents met the inclusion criteria, and those who no longer met the criteria or were deceased were excluded to prevent attrition bias. One of the residents was excluded from the post-intervention analysis because the resident was transferred to a skilled nursing facility during project implementation. Another resident passed away after the implementation of the project in January 2023; the data was counted as the resident remained in the home during the post-intervention phase. Demographic statistics are shown in Appendix N Table 1.

Medical Characteristics

Eleven residents from the three participating ARFPSHN homes were included. The residents were medically fragile and had multiple chronic conditions that affected their immune systems. The intellectual and developmental disability diagnoses were profound intellectual disabilities (n=11), cerebral palsy (n=4), seizure disorders (n=7), and autism (n=1). Other medical diagnoses were hyperlipidemia (n=6), diabetes mellitus type 2 (n=1), congestive heart failure (n=2), hypertension (n=2), and osteoporosis (n=5). Other health care needs included suprapubic catheter (n=1), gastrostomy management (n=8), nephrostomy management (n=1),

indwelling catheter (n=1), tracheostomy management (n=1), and urostomy care (n=1). Medical characteristics are shown in Appendix N, Table 2.

Potentially Avoidable Hospitalizations and Emergency Department Visits Without Hospitalization

Baseline Data

The baseline data showed twenty-five PAHs and five ED visits without hospitalization for the three ARFPSHN homes. ARFPSHN-A data were collected and analyzed for measures applicability from April 2021 to September 15, 2022. ARFPSHN-B from April 2021 to September 20, 2022, and ARFPSHN-C from April 2021 to October 18th, 2022. Retrospective data analysis of the unplanned hospitalization and ED visit without hospitalization of the selected ARFPSHN homes was conducted to verify if the cause was related to infectious disease and/or sepsis. Three primary diagnoses were identified as follows, Sepsis (48%, n=12), Pneumonia (28%, n=7) & Urinary Tract Infection (24%, n=6). For the ED visits without hospitalizations, the diagnosis was UTI for the five incidents. Unplanned hospitalization and ED visits non-related to infection processes were not accounted for in the baseline data.

Post-Intervention Data

The post-intervention for ARFPSHN-A started right after the onsite training was conducted from September 15 to December 31, 2022. Post-intervention for ARFPSHN-B was collected from September 20 to December 31, 2022. Post-intervention for ARFPSHN-C was collected from October 18 to December 31, 2022. For ARFPSHN-A, 12 healthcare workers (HCWs) could participate in the onsite training. For ARFPSHN-B, nine HCWs participated in the onsite training. For ARFPSHN-C, seven HCWs participated in the onsite training. The HCWs who could not participate in the onsite training reviewed the training content on their next

shift and completed the Stop and Watch practice scenario in conjunction with the SBAR communication tool for the licensed professionals.

During the post-intervention phase, eight PAHs were reported with three primary diagnoses consistent with the baseline data: sepsis (62.5%, n=5), UTI (25%, n=2), and PNA and UTI (12.5%, n=1). For ARFPSHN-A, the measures were used in 60% of the applicable PAHs; for ARFPSHN-B in 100% of the applicable PAHs; and for ARFPSHN-C, the measures were not implemented for the applicable PAH. Overall, staff implemented the measures in 50% of the PAHs.

The Stop & Watch tool Early Warning tool was used by the direct support professional when residents' changes in condition were identified and promptly reported to the licensed professional. The licensed professional completed the SBAR Communication tool properly following the notification by the direct support professional. Licensed staff performed an assessment, checked vital signs, and reviewed recent labs, medication changes, and recent medication orders. Two incidents occurred during the night shift; the licensed staff called the primary care physician, but the physician's response was delayed, prompting the licensed staff to call 911 instead. The other two PAHs occurred in the morning shift and the other one in the afternoon, and on both occasions licensed professional called 911 as the residents were in distress. Therefore, all four incidents resulted in the licensed professionals calling 911 per the organization's policy and procedure. The diagnoses reported by the ARFPSHNs for the PAH and ED visits without hospitalization were corroborated with the hospital ICD-10 code hospital admission diagnosis.

Two ED visits without hospitalizations occurred during the post-implementation period, but intervention measures were not applied. The ED visit for ARFPSHN-A did not result in

hospitalization. The resident had changes in condition, such as drowsier than usual, abnormal vital signs, and congestion per nurse assessment. During the ED visit, diagnostic tests were completed, but no treatment or new orders were given. The resident was sent back home the same day. An ED visit for ARFPSHN-C resulted in treatment starting at the ED and orders to continue treatment at home.

The tools were used on four other occasions for changes in condition that did not result in a PAH or EDV without hospitalization. Direct support professional completed the Stop and Watch Early Warning tool and reported to the licensed professional the identified changes in condition. Licensed professionals completed SBAR communication based on the change reported as deemed necessary. Enhanced close monitoring of the residents' changes in condition and improved communication among healthcare workers were noted. The table in Appendix Q summarizes a case-by-case analysis review of the PAH, EDV without hospitalization, and changes in conditions with the application of the measures.

Discussion

The purpose of this translation of evidence project with pre-and post-implementation was to decrease the PAHs and ED visits without hospitalizations rates by implementing and evaluating the effectiveness of measures for early detection of deteriorations indicative of sepsis. The SBAR Communication and Stop and Watch Early Warning tools were used to identify and communicate changes in condition for residents supported in the ARFPSHN homes. The findings show that measures were used in half of all applicable PAHs. The direct support staff reported residents' changes in condition to the licensed professional using the Stop and Watch Early Warning Tool. The category "Seems different than usual, Symptoms of new illness" was reported in 100% of the applied tools; however, "Tired, weak, confused, or drowsy" was only reported in 25% of the implemented tools. The licensed professional implemented the SBAR communication tool for the reported change in condition properly.

The Stop and Watch Early Warning tool and SBAR Communication tool were implemented in four changes in condition that did not result in a PAH or ED visit without hospitalization. Although the changes in condition identified did not result in residents' illness, it reinforced close monitoring of their health condition and improved communication among healthcare workers.

The measures were not applied in the case of ED visits without hospitalization despite efforts to educate staff. Adherence and disengagement were challenging in implementing the Stop and Watch Early Warning tool and the SBAR Communication tool. The project leader implemented biweekly checks with the champions via phone or email, but a response was not always obtained. On many occasions, a delay in response by champions and co-champions affected the scheduling of the onsite monitoring visits. Changes in staffing drove these

challenges. However, despite limitations, when staff used the Stop & Watch and SBAR tools appropriately, it allowed for improved detection of residents' changes in condition and enhanced communication among healthcare workers.

Limitations

There were several limitations identified during the implementation of this project. The sample size was limited, with only eleven residents participating in the pre-intervention data and ten residents participating in the post-intervention data. Additionally, the fourth ARFPSHN-D home did not participate as was initially agreed. The administrator of the fourth site canceled the first onsite training due to staffing constraints affecting the employee's availability to attend the training. Several staff members had to cover a double or longer shift. The second scheduled training was also canceled at that site due to a COVID-19 outbreak at that home. The challenges with recruiting the fourth site continued with the third scheduled onsite training canceled due to a time constraint at the residential facility as their team prepared for a state review visit.

Furthermore, COVID-19 exposures, active infections, and/or outbreaks in the participating ARFPSHN homes affected the project leader's ability to provide the in-person visit to review the measures' application. Lastly, the inconsistent implementation of the measures by the healthcare workers in the ARFPSHN homes affected the post-intervention data analysis. Although the measures are practical and can be reasonably incorporated as part of the healthcare worker's tasks, compliance was a barrier. Healthcare workers reported that measures were not completed because they failed to remember to do so, and there were no electronic technology reminders available at these homes. These factors made it difficult to resolve the challenges that arose in this project. In addition, there was hesitance by healthcare workers to complete an extra task not mandated in their work description duties, and the project leader had limited authority as

an outside trainer in the participating ARFPSHN homes. Therefore, ARFPSHN homes' program administrator involvement in mandating the use of the measures could improve consistency and compliance in applying the screening tools.

Future Implications

Implementing the INTERACT measures in long-term care reduces all-cause hospitalization rates and PAH rates (Huckfeldt et al., 2018; Ouslander et al., 2011; Ouslander et al., 2014). The INTERACT Quality Improvement Program contains various support tools and resources for the early identification of acute changes, healthcare pathways for managing patient changes in condition, certified champion training, and overview training for clinicians for patients served in skilled nursing facilities, home health, and assisted living. The program also includes tools for tracking, trending, and quality improvement resources to identify the root cause analyses of acute transfers. For this project, the Stop and Watch Early Warning Tool, SBAR Communication tool, and Acute Care Transfer Log were implemented based on their applicability to the residents supported in the ARFPSHN setting. Despite using only partial tools of the INTERACT QI program, data showed improved recognition of acute changes by direct support professionals and prompt reporting of changes in condition to licensed professionals.

Conclusions

The findings of this translation of evidence project are inconclusive due to the limited sample size, project's implementation period, and post-intervention data obtained. Despite the discussed limitations, findings demonstrated an improvement in recognition of subtle changes in condition by direct support professionals and effective communication among the healthcare workers. More studies are needed to evaluate the use of the INTERACT Quality Improvement program in ARFPSHN homes with a longer implementation period and a larger sample size to

evaluate its correlation with decreasing the potentially avoidable hospitalizations and emergency visits without hospitalization rates.

References

- Agency for Healthcare Research and Quality. (2020). Adult, nonmaternal inpatient stays related to sepsis: National trends by expected primary payer, 2012-2018. *Healthcare Cost and Utilization Project*. <https://hcup-us.ahrq.gov/reports/ataglance/HCUpanalysisSepsisTrendsUS.pdf>
- Agency for Healthcare Research and Quality. (2017). *A unit guide to infection prevention for long-term care staff*. <https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/quality-resources/tools/cauti-ltc/modules/resources/guides/guide-infection-prevention.pdf>
- Brangan, E., Banks, J., Brant, H., Pullyblank, A., Le Roux, H., & Redwood, S. (2018). Using the national early warning score (NEWS) outside acute hospital settings: A qualitative study of staff experiences in the West of England. *British Medical Journal Open*, 8(10), e022528–e022528. <https://doi.org/10.1136/bmjopen-2018-022528>
- Buckwalter, K., Cullen, L., Hanrahan, K., Kleiber, C., McCarthy, A. M., Rakel, B., Steelman, V., Tripp-Reimer, T., & Tucker, S. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing*, 14(3), 175–182. <https://doi.org/10.1111/wvn.12223>
- California Association of Health Facilities. (2021). *Guide to long term care*. <https://www.cahf.org/About/Consumer-Help/Guide-to-Long-Term-Care>
- California Department of Developmental Services. (2021). *Adult residential facility for person with special health care needs*. <https://www.dds.ca.gov/general/eligibility/living-arrangements/adult-residential-facility-for-persons-with-special-health-care-needs/>

- Carey, M. R., Prescott, H. C., Iwashyna, T. J., Wilson, M. E., Fagerlin, A., & Valley, T. S. (2020). Changes in self-rated health after sepsis in older adults: A retrospective cohort study. *Chest*, *158*(5), 1958–1966. <https://doi.org/10.1016/j.chest.2020.05.606>
- Centers for Disease Control and Prevention. (2012). *Principles of epidemiology in public health practice: An introduction to applied epidemiology and biostatistics (3rd ed.)*. <https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section2.html#:~:text=Morbidity%20has%20been%20defined%20as,disease%2C%20injury%2C%20and%20disability>
- Centers for Disease Control and Prevention. (2019). *Addressing gaps in healthcare for individuals with intellectual disabilities*. U.S Department of Health and Human Services. https://www.cdc.gov/video/phgr/2019/GR_10-15-2019_LowRes.mp4
- Centers for Disease Control and Prevention. (2020). *Disability and health overview*. <https://www.cdc.gov/ncbddd/disabilityandhealth/disability.html>
- Centers for Disease Control and Prevention. (2021a). *Health-related quality of life*. <https://www.cdc.gov/hrqol/index.htm>
- Centers for Disease Control and Prevention. (2021b). *What is sepsis?* https://www.cdc.gov/sepsis/what-is-sepsis.html#anchor_1547214418
- Center for Human Services University of California Davis. (2010). *Evaluation of senate bill 962 pilot project: Center for Human Services*. https://www.dds.ca.gov/wp-content/uploads/2019/02/WorkServices_962FinalReport_20190215.pdf
- Doody, M. C., & Doody, O. (2011). Introducing evidence into nursing practice: using the Iowa model. *British Journal of Nursing*, *20*(11), 661–664. <https://doi.org/10.12968/bjon.2011.20.11.661>

- Durning, V. M. (2020). Sepsis: A review for home healthcare clinicians. *Home Healthcare Now*, 38(4), 188-192. <https://doi.org/10.1097/NHH.0000000000000876>
- Gough, J. (2001). Public relations. *Nursing Standard*, 15(26), 63–63. <https://doi.org/10.7748/ns.15.26.63.s56>
- Grove, S. K., & Gray, J. R. (2019). *Understanding nursing research: Building an evidence-based practice* (7th ed.). Elsevier.
- Huckfeldt, P. J., Kane, R. L., Yang, Z., Engstrom, G., Tappen, R., Rojido, C., Newman, D., Reyes, B., & Ouslander, J. G. (2018). Degree of implementation of the interventions to reduce acute care transfers (INTERACT) Quality Improvement Program associated with number of hospitalizations. *Journal of the American Geriatrics Society (JAGS)*, 66(9), 1830–1837. <https://doi.org/10.1111/jgs.15476>
- Kane, R. L., Huckfeldt, P., Tappen, R., Engstrom, G., Rojido, C., Newman, D., Yang, Z., & Ouslander, J. G. (2017). Effects of an intervention to reduce hospitalizations from nursing homes: A randomized implementation trial of the INTERACT program. *Journal of the American Medical Association Internal Medicine*, 177(9), 1257–1264. <https://doi.org/10.1001/jamainternmed.2017.2657>
- Mihaljevic, S. E., & Howard, V. M. (2016). Incorporating interprofessional evidenced-based sepsis simulation education for certified nursing assistants (CNAs) and licensed care providers within long-term care settings for process and quality improvement. *Critical Care Nursing Quarterly*, 39(1), 24-33. <https://doi.org/10.1097/CNQ.0000000000000092>
- Mylotte, J. M. (2020). What is the role of nursing homes in the surviving sepsis campaign? *Journal of the American Medical Directors Association*, 21(1), 41-45. <https://doi.org/10.1016/j.jamda.2019.07.022>.

- Ouslander, J. G., Bonner A., Herndon L., Shutes, J. (2014). The Interventions to Reduce Acute Care Transfers (INTERACT) quality improvement program: An overview for medical directors and primary care clinicians in long term care. *Journal of the American Medical Directors Association*, 15(3), 162-170. <https://doi.org/10.1016/j.jamda.2013.12.005>
- Ouslander, J. G., Lamb, G., Tappen, R., Herndon, L., Diaz, S., Ross, B. A., Grabowski, D. C., & Bonner, A. (2011). Interventions to reduce hospitalizations from nursing homes: Evaluation of the INTERACT II Collaborative Quality Improvement Project. *Journal of the American Geriatrics Society (JAGS)* 59(4), 745–753. <https://doi.org/10.1111/j.1532-5415.2011.03333.x>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *British Medical Journal*, 372. <https://doi.org/10.1136/bmj.n71>
- Paoli, J. P., Reynolds, M. A., Sinha, M., Gitlin, M., & Crouser, E. (2018). Epidemiology and costs of sepsis in the United States—An analysis based on timing of diagnosis and severity level. *Critical Care Medicine*, 46(12), 1889–1897. <https://doi.org/10.1097/CCM.0000000000003342>
- Polit, D. F., & Beck, C.T. (2021). *Nursing research: Generating and assessing evidence for nursing practice* (11th ed.). Wolters Kluwer Press.

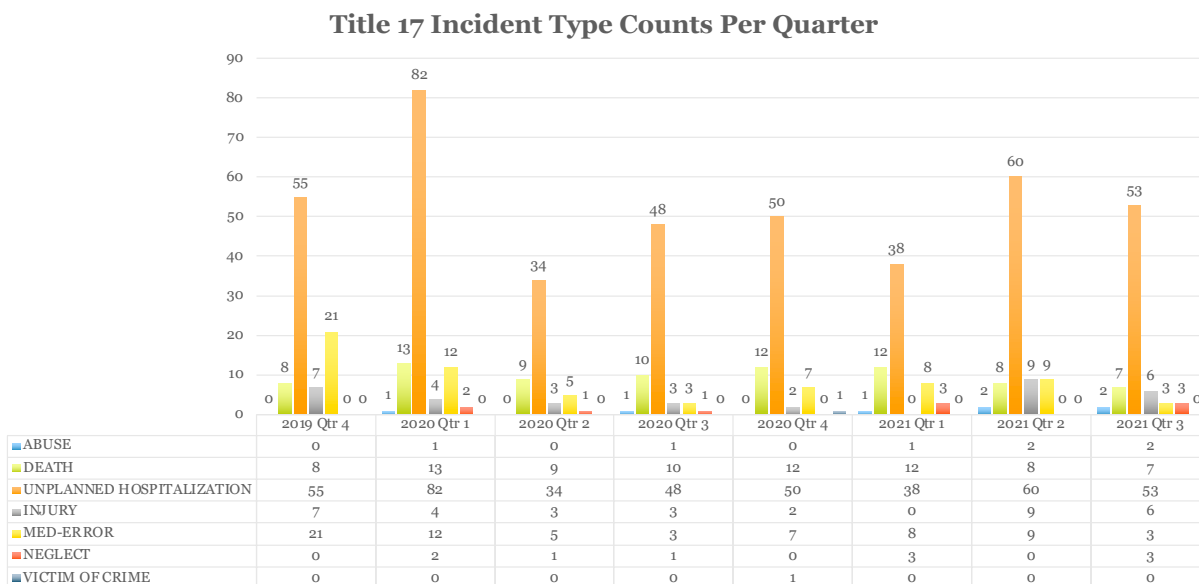
- Porter, T. K., Turner, K. M., McMillian-Bohler, J., & De Gagne, J. C. (2021). Improving care of skilled nursing patients: Implementation of early sepsis recognition. *Journal of Gerontological Nursing*, 47(8), 37–44. <https://doi.org/10.3928/00989134-20210624-02>
- Reyes, B. J., Chang, J., Vaynberg, L., Diaz, S., & Ouslander, J. G. (2018). Early identification and management of sepsis in nursing facilities: Challenges and opportunities. *Journal of the American Medical Directors Association*, 19(6), 465-471. <https://doi.org/10.1016/j.jamda.2018.04.004>
- Rogers, D. M. (1983). *Diffusion of innovations*. The Free Press.
- Richards, C. (2020). Infections in residents of long-term care facilities: An agenda for research report of an expert panel. *Journal of the American Geriatrics Society*, 50(3), 570–576. <https://doi.org/10.1046/j.1532-5415.2002.50128.x>
- Segal, M., Rollins, E., Hodges, K., & Roozeboom, M. (2014). Medicare-Medicaid eligible beneficiaries and potentially avoidable hospitalizations. *Centers for Medicare & Medicaid Services: Office of Information Product & Data Analytics*, 4(1), E1-E10. https://www.cms.gov/mmrr/downloads/mmrr2014_004_01_b01.pdf
- Sepsis Alliance Institute. (2022). *Sepsis and intellectual and developmental disability*. Retrieved April 10, 2023 from <https://www.sepsisinstitute.org/content/sepsis-and-intellectual-and-developmental-disability>
- Singer, M., Deutschman, C. S., Seymour, C. W., Shankar-Hari, M., Annane, D., Bauer, M., Bellomo, R., Bernard, G. R., Chiche, J-D, Coopersmith, C. M., Hotchkiss, R. S., Levy, M. M., Marshall, J. C., Martin, G. S., Opal, S. M., Rubenfeld, G. D., Van der Poll, T., Vincent, L., & Angus, D. C. (2016). The third international consensus definitions for

- sepsis and septic Shock (Sepsis-3). *Journal of the American Medical Association*, 315(8), 801–810. <https://doi.org/10.1001/jama.2016.0287>
- Shankar-Hari, M., Ambler, M., Mahalingasivam, V. Jones, A., Rowan K., & Rubenfeld, G. D. (2016). Evidence for a causal link between sepsis and long-term mortality: A systematic review of epidemiologic studies. *Critical Care*, 20(101). <https://doi.org/10.1186/s13054-016-1276-7>
- Sloane, P. D., Ward, K., Weber, D.J., Kistler, C. E., Brown, B., Davis, K., & Zimmerman, S. (2018). Can sepsis be detected in the nursing home prior to the need for hospital transfer? *Journal of the American Medical Directors Association*, 19(6), 492-496.e1. <https://doi.org/10.1016/j.jamda.2018.02.00>
- Tappen, R. M., Wolf, D. G., Rahemi, Z., Engstrom, G., Rojido, C., Shutes, J. M., & Ouslander, J. G. (2017). Barriers and facilitators to implementing a change initiative in long-term care using the INTERACT® Quality Improvement Program. *The Health Care Manager*, 36(3), 219–230. <https://doi.org/10.1097/HCM.000000000000168>
- Titler, M. G., Kleiber, C., Steelman, V., Goode, C., Rakel, B., Barry-Walker, J., Small, S., Buckwalter, K. (1994). Infusing research into practice to promote quality care. *Nursing Research*, 43(5), 307-13. PMID: 7937178.
- U.S. Department of Health and Human Services. (2018, April). *Fiscal year 2019 annual performance plan and report – Goal 3 objective 4*. <https://www.hhs.gov/about/budget/fy2019/performance/performance-plan-goal-3-objective-4/index.html>

- U.S. Department of Health and Human Services. (2020). *Healthy people 2030: People with disabilities*. <https://health.gov/healthypeople/objectives-and-data/browse-objectives/people-disabilities>
- U.S. Department of Health and Human Services. (2021, September 10). *National institute of general medical sciences: Sepsis*. <https://nigms.nih.gov/education/factsheets/Pages/sepsis.aspx>
- Watson, C. A., Bulechek G. M., McCloskey J. C. (1987). QAMUR: a quality assurance model using research. *Journal of Nursing Quality Assurance*, 2(1), 21-7. <https://doi.org/10.1097/00001786-198711000-00005>
- Yoshikawa, T. T., Reyes, B. J., & Ouslander, J. G. (2019). Sepsis in older adults in long-term care facilities: Challenges in diagnosis and management. *Journal of the American Geriatric Society*, 67(11), 2234-2239. <https://doi.org/10.1111/jgs.16194> .
- Zandam, H., Mitra, M., Akobirshoev, I., Li, F. S., & Ne'eman, A. (2022). Infectious diseases-related emergency department visits among non-elderly adults with intellectual and developmental disabilities in the United States: Results from the national emergency department sample, 2016. *Population Health Management*, 25(3), 335–342. <https://doi.org/10.1089/pop.2021.0218>

Appendix A

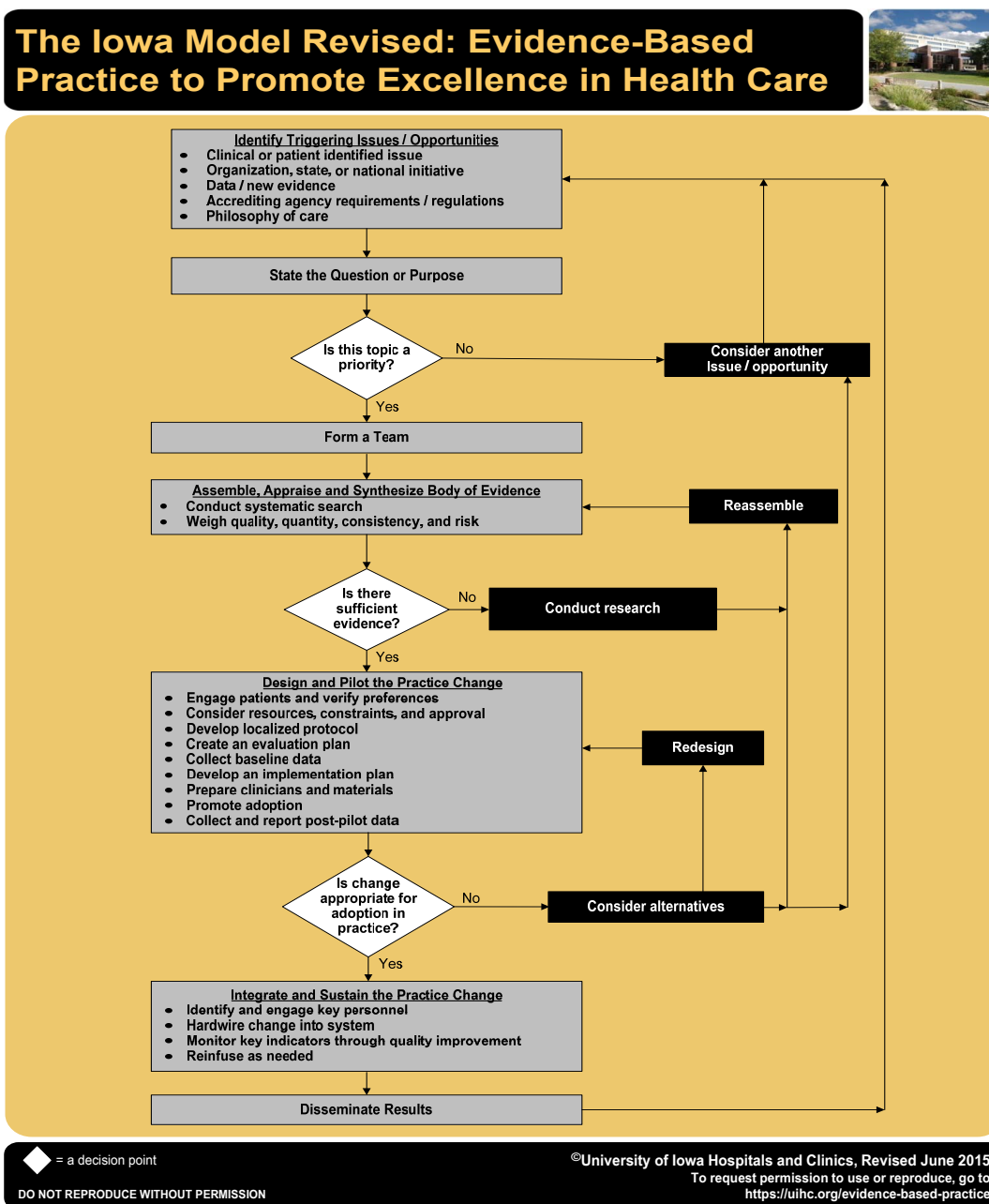
Title 17 Incident Type Counts Per Quarter for ARFPSHNs in California



Note: Total number of ARFPSHN facilities in California is 92, total census of 438 residents.

Appendix B

The Revised Iowa Model of Evidence-Based Practice to Promote Quality Care



Note: Used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2015. For permission to use or reproduce, please contact the University of Iowa Hospitals and Clinics at 319-384-9098.

Appendix C

Iowa Model Permission

Monday, May 9, 2022 at 21:43:38 Pacific Daylight Time

Subject: [External] Permission to Use The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care
Date: Friday, February 25, 2022 at 4:21:30 PM Pacific Standard Time
From: Kimberly Jordan - University of Iowa Hospitals and Clinics
To: Macias, Nohely

External Email Use Caution and Confirm Sender

You have permission, as requested today, to review and/or reproduce *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care*. Click the link below to open.

[The Iowa Model Revised \(2015\)](#)

Copyright is retained by University of Iowa Hospitals and Clinics. **Permission is not granted for placing on the internet.**

Reference: Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing, 14(3), 175-182. doi:10.1111/wvn.12223*

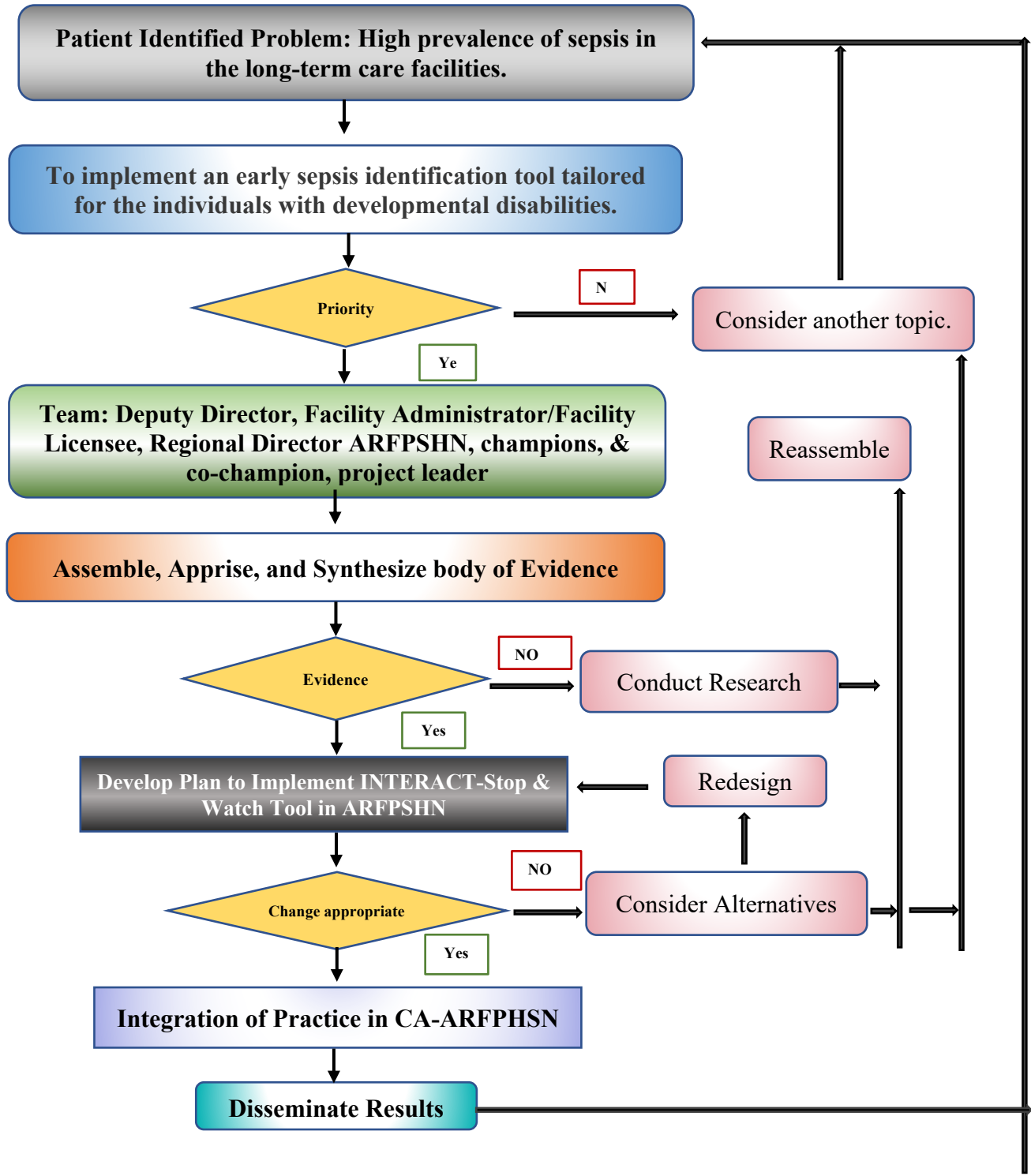
In written material, please add the following statement:

Used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2015. For permission to use or reproduce, please contact the University of Iowa Hospitals and Clinics at 319-384-9098.

Please contact UIHCNursingResearchandEBP@uiowa.edu or 319-384-9098 with questions.

Appendix D

Iowa Model: Sepsis Early Identification Tool in Residential Facilities



Appendix E

Figure 3

INTERACT MODEL 4.5 Stop and Watch Early Warning Tool

Stop and Watch Early Warning Tool



If you have identified a change while caring for or observing a resident/patient, please **circle** the change and notify a nurse. Either give the nurse a copy of this tool or review it with her/him as soon as you can.

S T O P a n d W A T C H	Seems different than usual; Symptoms of new illness
	Talks or communicates less
	Overall needs more help
	Pain – new or worsening; Participated less in activities
	Ate less
	No bowel movement in 3 days; or diarrhea
	Drank less
	Weight change; swollen legs or feet
	Agitated or nervous more than usual
	Tired, weak, confused, or drowsy
	Change in skin color or condition
	Help with walking, transferring, toileting more than usual
	<input type="checkbox"/> Check here if no change noted while monitoring high risk patient

Patient / Resident

Your Name

Reported to

Date and Time (am/pm)

Nurse Response

Date and Time (am/pm)

Nurse's Name

© 2014-2021 Version 4.5, Florida Atlantic University, all rights reserved.
This document is available for clinical use, but may not be resold or incorporated in software without the permission of Florida Atlantic University.

Note: Used with permission from Pathway Health Services Inc.

Figure 4

INTERACT MODEL 4.5 SBAR Communication Form

SBAR Communication Form

and Progress Note for RNs/LPN/LVNs



Before Calling the Physician / NP / PA / other Healthcare Professional:

- Evaluate the Resident/Patient:** Complete relevant aspects of the SBAR form below
- Check Vital Signs:** BP, pulse, and/or apical heart rate, temperature, respiratory rate, O₂ saturation and finger stick glucose for diabetics
- Review Record:** Recent progress notes, labs, medications, other orders
- Review an INTERACT Care Path or Acute Change in Condition File Card, if indicated**
- Have Relevant information Available when Reporting** e.g., medical record, vital signs, advance directives such as DNR and other care limiting orders, allergies, medication list

SITUATION

The change in condition, symptoms, or signs observed and evaluated is/are _____

This started on ____/____/____ Since this started it has gotten: Worse Better Stayed the same

Things that make the condition or symptom **worse** are _____

Things that make the condition or symptom **better** are _____

This condition, symptom, or sign has occurred before: Yes No

Treatment for last episode (if applicable) _____

Other relevant information _____

BACKGROUND

Resident/Patient Description

This resident/patient is in the facility for: Long-Term Care Post-Acute Care Other: _____

Primary diagnoses _____

Other pertinent history (e.g., medical diagnosis of CHF, DM, COPD, isolation for infection or communicable disease) _____

Medication Alerts

Changes in the last week (describe) _____

Resident/patient is on (Warfarin/Coumadin) Result of last INR: _____ Date ____/____/____

Resident/patient is on other anticoagulant (direct thrombin inhibitor or platelet inhibitor)

Resident/patient is on: Hypoglycemic medication(s) / Insulin Digoxin

Allergies _____

Vital Signs

BP _____ Pulse _____ (or Apical HR _____) RR _____ Temp _____ Weight _____ lbs (date ____/____/____)

For HF, edema, or weight loss: last weight before the current one was _____ on ____/____/____

Pulse Oximetry (if indicated) _____% on Room Air O₂ (_____)

Blood Sugar (Diabetics) _____

Resident /Patient Name _____

(continued)

Note: Used with permission from Pathway Health Services Inc.

SBAR Communication Form

and Progress Note for RNs/LPN/LVNs (cont'd)



Resident/Patient Evaluation

Note: Except for Mental and Functional Status evaluations, if the item is not relevant to the change in condition check the box for "not clinically applicable to the change in condition being reported".

1. Mental Status Evaluation (compared to baseline; check all changes that you observe)

- | | | |
|---|---|--|
| <input type="checkbox"/> Altered level of consciousness (<i>hyperalert, drowsy but easily aroused, difficult to arouse</i>) | <input type="checkbox"/> New or worsened delusions or hallucinations | <input type="checkbox"/> Other (describe) |
| <input type="checkbox"/> Increased confusion or disorientation | <input type="checkbox"/> Other symptoms or signs of delirium (e.g. <i>inability to pay attention, disorganized thinking</i>) | <input type="checkbox"/> No changes observed |
| <input type="checkbox"/> Memory loss (<i>new or worsening</i>) | <input type="checkbox"/> Unresponsiveness | |

Describe symptoms or signs _____

2. Functional Status Evaluation (compared to baseline; check all that you observe)

- | | | |
|--|--|--|
| <input type="checkbox"/> Decreased mobility | <input type="checkbox"/> Swallowing difficulty | <input type="checkbox"/> Other (describe) |
| <input type="checkbox"/> Needs more assistance with ADLs | <input type="checkbox"/> Weakness (<i>general</i>) | <input type="checkbox"/> No changes observed |
| <input type="checkbox"/> Falls (one or more) | | |

Describe symptoms or signs _____

3. Behavioral Evaluation

- | | | |
|--|--|--|
| <input type="checkbox"/> Not clinically applicable to the change in condition being reported | | |
| <input type="checkbox"/> Danger to self or others | <input type="checkbox"/> Suicide potential | <input type="checkbox"/> Personality change |
| <input type="checkbox"/> Depression (<i>crying, hopelessness, not eating</i>) | <input type="checkbox"/> Verbal aggression | <input type="checkbox"/> Other behavioral changes (describe) |
| <input type="checkbox"/> Social withdrawal (<i>isolation, apathy</i>) | <input type="checkbox"/> Physical aggression | <input type="checkbox"/> No changes observed |

Describe symptoms or signs _____

4. Respiratory Evaluation

- | | | |
|---|---|---|
| <input type="checkbox"/> Not clinically applicable to the change in condition being reported | | |
| <input type="checkbox"/> Abnormal lung sounds (<i>rales, rhonchi, wheezing</i>) | <input type="checkbox"/> Inability to eat or sleep due to SOB | <input type="checkbox"/> Symptoms of common cold |
| <input type="checkbox"/> Asthma (<i>with wheezing</i>) | <input type="checkbox"/> Labored or rapid breathing | <input type="checkbox"/> Other respiratory changes (describe) |
| <input type="checkbox"/> Cough (<input type="checkbox"/> Non-productive <input type="checkbox"/> Productive) | <input type="checkbox"/> Shortness of breath | <input type="checkbox"/> No changes observed |

Describe symptoms or signs _____

5. Cardiovascular Evaluation

- | | | |
|--|---|--|
| <input type="checkbox"/> Not clinically applicable to the change in condition being reported | | |
| <input type="checkbox"/> Chest pain/tightness | <input type="checkbox"/> Irregular pulse (<i>new</i>) | <input type="checkbox"/> Other (describe) |
| <input type="checkbox"/> Edema | <input type="checkbox"/> Resting pulse >100 or <50 | <input type="checkbox"/> No changes observed |
| <input type="checkbox"/> Inability to stand without severe dizziness or lightheadedness | | |

Describe symptoms or signs _____

6. Abdominal / GI Evaluation

- | | | |
|--|---|---|
| <input type="checkbox"/> Not clinically applicable to the change in condition being reported | | |
| <input type="checkbox"/> Abdominal pain | <input type="checkbox"/> Distended abdomen | <input type="checkbox"/> Jaundice |
| <input type="checkbox"/> Abdominal tenderness | <input type="checkbox"/> Decreased appetite/fluid intake | <input type="checkbox"/> Nausea and/or vomiting |
| <input type="checkbox"/> Constipation
(date of last BM ____/____/____) | <input type="checkbox"/> Diarrhea | <input type="checkbox"/> Other (describe) |
| <input type="checkbox"/> Decreased/absent bowel sounds | <input type="checkbox"/> GI Bleeding (<i>blood in stool or vomitus</i>) | <input type="checkbox"/> No changes observed |
| | <input type="checkbox"/> Hyperactive bowel sounds | |

Describe symptoms or signs _____

Resident/Patient Name _____

(continued)

Note: Used with permission from Pathway Health Services Inc.

SBAR Communication Form

and Progress Note for RNs/LPN/LVNs (cont'd)



7. GU/Urine Evaluation

Not clinically applicable to the change in condition being reported

Blood in urine

Decreased urine output

Lower abdominal pain or tenderness

New or worsening incontinence

Painful urination

Urinating more frequently or urgency with or without other urinary symptoms

Other (describe)

No changes observed

Describe symptoms or signs _____

8. Skin Evaluation

Not clinically applicable to the change in condition being reported

Abrasion

Blister

Burn

Contusion

Discoloration

Itching

Laceration

Pressure ulcer/pressure injury

Puncture

Rash

Skin tear

Splinter/sliver

Wound (describe)

Other (describe)

No changes observed

Describe symptoms or signs _____

9. Pain Evaluation

Not clinically applicable to the change in condition being reported

Does the resident have pain?

No

Yes (describe below)

Is the pain?

New

Worsening of chronic pain

Description/location of pain: _____

Intensity of Pain (rate on scale of 1-10, with 10 being the worst): _____

Does the resident show non-verbal signs of pain (for residents with dementia)?

No

Yes (describe) _____
(restless, pacing, grimacing, new change in behavior)

Other information about the pain _____

10. Neurological Evaluation

Not clinically applicable to the change in condition being reported

Abnormal Speech

Altered level of consciousness (hyperalert, drowsy but easily arousable, difficult to arouse, unarousable)

Seizure

Weakness or hemiparesis

Dizziness or unsteadiness

Other neurological symptoms (describe)

No changes observed

Describe symptoms or signs _____

Advance Care Planning Information (the resident/patient has orders for the following advanced care planning)

Full Code DNR DNI (Do Not Intubate) DNH (Do Not Hospitalize) No Enteral Feeding Other Order or Living Will (specify)

Other resident/patient or representative preferences for care

Resident/Patient Name _____

(continued)

Note: Used with permission from Pathway Health Services Inc.

SBAR Communication Form

and Progress Note for RNs/LPN/LVNs



APPEARANCE

Summarize your observations and evaluation: _____

REVIEW AND NOTIFY

Primary Care Clinician Notified: _____ Date ____/____/____ Time (am/pm) _____

Recommendations of Primary Clinicians (if any) _____

b. Check *all* that apply

Testing

- COVID Test
- If yes – check all that apply:*
 - Viral PCR (Nasal Swab)
 - Viral PCR (Saliva Swab)
 - POC Antigen Test
 - Antibody Test

- Blood tests
- EKG
- Urinalysis and/or culture
- Venous doppler
- X-ray
- Other (describe) _____

Interventions

- New or change in medication(s)
- IV or subcutaneous fluids
- Increase oral fluids
- Oxygen (if available)
- Other (describe) _____

- Transfer to the hospital (non-emergency) (send a copy of this form)
- Call for 911
- Emergency medical transport

Nursing Notes (for additional information on the Change in Condition)

Name of Family/Health Care Agent Notified: _____ Date ____/____/____ Time (am/pm) _____

Staff Name (RN/LPN/LVN) and Signature _____

Resident/Patient Name _____

Note: Used with permission from Pathway Health Services Inc.

Appendix F

Institute Review Board of California State University, Long Beach Approval



CALIFORNIA STATE UNIVERSITY, LONG BEACH

OFFICE OF RESEARCH & SPONSORED PROGRAMS

DATE: August 16, 2022

TO: Nohely Macias, MSN
FROM: CSULB IRB

PROJECT TITLE: [1933841-1] Implementation of an Early sepsis Identification Tool in Long-term Care

REFERENCE #: 22-278

SUBMISSION TYPE: New Project

REVIEW TYPE: Exempt Review

ACTION: APPROVED under 45 CFR 46 exempt 104(D)(3).

APPROVAL DATE: August 16, 2022

This is to advise you that the Institutional Review Board for the Protection of Human Subjects (IRB) of California State University, Long Beach, has reviewed your protocol application.

Your application is approved by Exempt Review under category [REVIEW CATEGORY] according to the U.S. Department of Health & Human Services regulation at 45 CFR 46. 101 [SECTION].

Approval is effective beginning August 16, 2022 and conditional upon your willingness to carry out your continuing responsibilities under University policy:

1. If you need to make changes/revisions to this approved project, you must submit a Request for Amendment to an Approved Protocol form in addition to any documents affected by the requested change. Submit these documents as a subsequent package to your approved project in IRBNet. You are not allowed to implement any changes to your research activities prior to obtaining final approval of your Amendment from the CSULB IRB.
2. You are required to inform the Director of Research Integrity and Compliance, Office of Research & Sponsored Programs, via email at ORSPCompliance within twenty-four hours of any adverse event in the conduct of research involving human subjects. The report shall include the nature of the adverse event, the names of the persons affected, the extent of the injury or breach of confidentiality or data security, if any, and any other information material to the situation.
3. Maintain your research records as detailed in the protocol.

Should you have any questions about the conduct of your research under this protocol, particularly about providing informed consent and unexpected contingencies, please do not hesitate to call the Office of Research & Sponsored Programs at (562) 985-8147. We wish you the best of success in your research.

Appendix G

Letter of Support from Organization for Project Implementation



Approval Letter

Insert date: 05/20/2022

This letter is to show that, I, [REDACTED], as the Regional Director of [REDACTED] California, give permission to Nohely Macias to conduct the project titled Sepsis Early Identification Tool in Long-Term Care on the following Adult Residential Facilities(s) for Persons with Special Health Needs [REDACTED]

Upon obtaining all necessary clearances from the Regional Director and after obtaining the necessary IRB determination/approval, the above-named project lead is allowed to:

- (1) collect data on residents' clinical records that include residents' demographics, medical diagnoses, hospital admissions data, emergency visits data, and special incidents reports.
- (2) access necessary documents/data that include residents' demographics, individual health care plans (IHCPs), health care plans (HCPs), registered nurse assessment, primary care physician evaluations, special incident reports, residents' clinical records, and nursing documentation
- (3) conduct necessary interactions with staff/patients relevant to the project preparation and training
- (4) tool implementation analysis post-intervention including nursing assessment evaluation and notes
- (5) frequent communication with registered nurse as the assigned champion and night shift nurse as the co-champion

The project lead is responsible for ensuring that all activities related to conducting the project are in compliance with the policies that govern practice, HIPPA, and research and research-related regulations at Elwyn facilities and its covered entities.

If you have any questions or concerns, please do not hesitate to contact me.

Signature:

[REDACTED]

May 20, 2022

Name: [REDACTED]

Title: [REDACTED]

Contact Information: [REDACTED]

Appendix H

Pathway Health Educational License for Assisted Living

INTERACT FOR ASSISTED LIVING LICENSE AGREEMENT

THIS LIMITED LICENSE AGREEMENT (this "Agreement") is made effective as of this 25th day of April, 2022 ("Effective Date") and is entered into between Pathway Health Services, Inc. ("Pathway") a Minnesota corporation with an address of 11240 Stillwater Blvd N, Lake Elmo, MN 55042 and Nohely Macias ("Limited-Licensee"), an individual with its principal address at [REDACTED]

This limited license details the use of a group of materials known as INTERACT® Tools For Assisted Living that includes certain electronic and/or written materials such as pdf, Excel and Word documents available at pathway-interact.com. This Agreement covers your permitted download, installation of these documents on your computer, and use of the INTERACT® Licensed Materials (defined below). BY SIGNING THIS LIMITED LICENSE AGREEMENT AND CLICKING ON THE "I AGREE" BUTTON AT <http://www.pathway-interact.com/interact-tools/> AND PRESSING THE ENTER KEY, YOU ACKNOWLEDGE THAT YOU HAVE READ ALL OF THE TERMS AND CONDITIONS OF THIS AGREEMENT, UNDERSTAND THEM, AND AGREE TO BE LEGALLY BOUND BY THEM. If you do not agree with the terms of this Agreement and click the "I DISAGREE" button at <http://www.pathway-interact.com/interact-tools/>, you may not download, install or use the INTERACT® Licensed Materials. As used in this Agreement, " INTERACT® Licensed Materials" means the INTERACT® documents downloaded from this website in electronic (pdf, Word, Excel etc.) or written format and the INTERACT® trademark.

1. DEFINITIONS.

- a. "INTERACT Licensed Intellectual Property" shall mean collectively the INTERACT Licensed Marks and INTERACT Licensed Copyrighted Material.
- b. "INTERACT Licensed Marks" shall mean the term "INTERACT" and formatives thereof, both with and without graphical components, as used with goods and services relating to interventions to reduce acute care transfers from health care facilities, and specifically including the Registered Trademark protected by US Registration No. 4,236,059 (the "Registered Trademark").
- c. "INTERACT Licensed Materials" shall mean: (i) Appendix A for INTERACT Tools for Assisted Living and any updates, releases or subsequent versions thereto, which contain and embody INTERACT Licensed Intellectual Property including INTERACT Licensed Copyrights and/or INTERACT Licensed Trademarks.

2. FEES. Educational use of INTERACT® Licensed Materials is provided without charge, but use and access of these materials is contingent on following the terms of this Agreement.
3. GRANT OF LICENSE. Subject to the terms and conditions of this Agreement, Pathway grants to you a limited, non-exclusive, non-transferable license (the " INTERACT® Tools for Assisted Living") to download, install and use the INTERACT® Licensed Materials solely for your educational purposes. Pathway shall retain all title, copyright, trademark rights, and other intellectual proprietary rights in, and ownership of,

INTERACT FOR ASSISTED LIVING LICENSE AGREEMENT

the INTERACT® Licensed Materials regardless of the media upon which the original or any copy may be recorded or fixed. Any rights in INTERACT® Licensed Materials not granted herein are expressly reserved by Pathway.

4. **SCOPE OF USE.** Your use of the INTERACT® Licensed Materials may not exceed the applicable use restrictions under this Agreement.
5. **OTHER RESTRICTIONS. THESE INTERACT® LICENSED MATERIALS MAY NOT BE RESOLD OR USED AS CONTENT OR ADVERTISING FOR COMMERCIAL (FEE FOR SERVICE) TRAINING SEMINARS, WEBINARS, OR CONSULTING SERVICES; THESE MATERIALS MAY NOT BE INCORPORATED INTO SOFTWARE, INCLUDING BUT NOT LIMITED TO ELECTRONIC HEALTHCARE RECORD SYSTEMS; NO REVERSE ENGINEERING.** You shall not directly or indirectly: (i) sell, lease, redistribute or transfer any of the INTERACT® Licensed Materials, whether in printed or electronic form; (ii) modify, create software programs based on, translate, create derivative works based on, sublicense, or distribute any of the INTERACT® Licensed Materials; (iii) rent, lease or license any rights in any of the INTERACT® Licensed Materials in any form to any person; (iv) you may not use any INTERACT® Licensed Materials for the benefit of any third parties or in any way other than your internal operations and internal business purposes; (v) or remove, alter or obscure any proprietary or copyright or trademark notices, labels, or marks on or within the INTERACT® Licensed Materials or any copies thereof; (vi) use INTERACT® Tools for Nursing Homes or use INTERACT® Tools for Home Health Care are not permitted without a separate license agreement. You are responsible for all use of the INTERACT® Licensed Materials and for any downloading, installing and using the INTERACT® Licensed Materials and for compliance with this Agreement; any breach by you or any user shall be deemed to have been made by you. This Agreement does not transfer to you any title or any ownership right or interest in any INTERACT® Licensed Materials or in any other intellectual property rights of Pathway or Florida Atlantic University. You acknowledge that the INTERACT® Licensed Materials and that the trademark INTERACT® used alone and with associated logos as in US Registration No. 4,236,059, as used in connection with these products is owned by Florida Atlantic University. You are not permitted to make any use of or alteration to the INTERACT® trademarks beyond the terms of this Agreement without the written authorization of Pathway. Printing by a third party print vendor is permissible, provided that the INTERACT licensed materials are not altered, that the INTERACT trademark and footer are present, that no 3rd party trademark is applied, and that what you print is only for your internal and educational use and that you print no more than is necessary for your own internal use.
6. **TECHNICAL SUPPORT.** No technical support or guidance for use will be provided by Pathway concerning the proper use of INTERACT® Licensed Materials beyond this license agreement.
7. **WARRANTY AND DISCLAIMER. INTERACT® LICENSED MATERIALS, AND ANY OTHER DOCUMENTATION, MATERIALS AND/OR DATA PROVIDED BY PATHWAY ARE PROVIDED "AS IS" AND "WITH ALL FAULTS," AND PATHWAY EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES OF ANY KIND**

INTERACT FOR ASSISTED LIVING LICENSE AGREEMENT

OR NATURE, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF OPERABILITY, CONDITION, TITLE, NON-INFRINGEMENT, NON-INTERFERENCE, QUIET ENJOYMENT, VALUE, ACCURACY OF DATA, OR QUALITY, AS WELL AS ANY WARRANTIES OF MERCHANTABILITY, WORKMANSHIP, SUITABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR THE ABSENCE OF ANY DEFECTS THEREIN, WHETHER LATENT OR PATENT. NO WARRANTY IS MADE BY PATHWAY ON THE BASIS OF TRADE USAGE, COURSE OF DEALING OR COURSE OF TRADE. PATHWAY DOES NOT WARRANT THAT THE INTERACT® LICENSED MATERIALS OR ANY OTHER INFORMATION, MATERIALS, DOCUMENTATION OR TECHNOLOGY PROVIDED UNDER THIS AGREEMENT WILL MEET YOUR REQUIREMENTS OR THAT THE OPERATION THEREOF WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT ALL ERRORS WILL BE CORRECTED. YOU ACKNOWLEDGE THAT PATHWAY'S OBLIGATIONS UNDER THIS AGREEMENT ARE FOR YOUR BENEFIT ONLY. Pathway makes no warranty associated with the use of INTERACT® Licensed Materials to change the clinical outcome or aggregate re-hospitalization rates for Long Term Care Facilities or other health care facilities or health care practitioners that choose to utilize INTERACT® Licensed Materials.

8. **LIMITATION OF LIABILITY.** IN NO EVENT WILL PATHWAY BE LIABLE FOR NEGLIGENCE, STRICT LIABILITY, BREACH OF CONTRACT, MISREPRESENTATION AND OTHER CONTRACT OR TORT CLAIMS ARISING FROM OR RELATED TO THIS AGREEMENT, OR THE USE OF THE INTERACT® LICENSED MATERIALS.
9. **GOVERNING LAW; ARBITRATION.** This Agreement shall be governed in all respects by the laws of the State of Minnesota, USA, without regard to choice-of-law rules or principles.
10. **SEVERABILITY.** If any provision of this Agreement is held to be illegal or unenforceable for any reason, then such provision shall be deemed to be restated so as to be enforceable to the maximum extent permissible under law, and the remainder of this Agreement shall remain in full force and effect.
11. **ASSIGNMENT.** You may not assign or otherwise transfer this Agreement without Pathway's prior written consent.
12. **COUNTERPARTS.** This Agreement may be executed in any number of duplicate originals and each such duplicate original shall be deemed to constitute one and the same instrument.

INTERACT FOR ASSISTED LIVING LICENSE AGREEMENT

IN WITNESS WHEREOF , the parties have executed this Limited License Agreement by their duly authorized representatives as of the day and year first above written.

PATHWAY HEALTH SERVICES INC.

By: [Redacted]

Name: [Redacted]
Title: C [Redacted]

Date: Apr 26, 2022

INDIVIDUAL

By: [Redacted]

Name: Nohely Macias
[Redacted]

Educational Institution:
Southern California CSU DNP Consortium;
California State University, Fullerton;
California State University, Long Beach; &
California State University, Los Angeles

Date: Apr 25, 2022

INTERACT FOR ASSISTED LIVING LICENSE AGREEMENT

Appendix A

INTERACT TOOLS FOR ASSISTED LIVING

INTERACT Assisted Living Tool Table
Using INTEACT Assisted Living Tools in Everyday Care Assisted Living
Implementation Guide
Acute Care Transfer Log
INTERACT Hospitalization Rate Tracking Tool – Excel Template
Quality Improvement Tool for Review of Acute Care Transfers
Quality Improvement Summary
Implementation Checklist
Stop and Watch Early Warning Tool
Stop and Watch Early Warning Tool – Spanish
SBAR Communication Form and Progress Notes for RN/LPN/LVNS
SBAR Communication Form and Progress Notes for Caregivers (other than nurses)
Assisted Living Capabilities List
Assisted Living to Hospital Transfer Form
Assisted Living to Hospital Transfer Data List
Medication Reconciliation Worksheet
Acute Change in Condition File Cards
Care Paths
Acute Mental Status Change
Change in Behavior: Evaluation of Medical Causes of New or Worsening Behavioral Symptoms
Dehydration (potential for)
Fever
Gastrointestinal (GI Symptoms)
Shortness of Breath (SOB)
Symptoms of Congestive Heart Failure (CHF)
Symptoms of Lower Respiratory Infection
Symptoms of Urinary Tract Infection (UTI)
Advance Care Planning Tracking Form
Advance Care Planning Communication Guide
Identifying Patients Who May be Appropriate for Hospice or Palliative/Comfort Care Orders
Comfort Care Interventions – Examples
Deciding About Going to the Hospital
Education on CPR for Patients and Families
Education on Tube Feeding for Patients and Families

Appendix I

Pathway Health Educational License for Skilled Nursing

INTERACT FOR SKILLED NURSING LICENSE AGREEMENT

THIS LIMITED LICENSE AGREEMENT (this "Agreement") is made effective as of this 25th day of April, 2022 ("Effective Date") and is entered into between Pathway Health Services, Inc. ("Pathway") a Minnesota corporation with an address of 11240 Stillwater Blvd N, Lake Elmo, MN 55042 and Nohely Macias ("Limited-Licensee"), an individual with its principal address at 832 S Boulder Place, Anaheim, CA 92808.

This limited license details the use of a group of materials known as INTERACT® Tools For Nursing Homes that includes certain electronic and/or written materials such as pdf, Excel and Word documents available at <http://www.pathway-interact.com>. This Agreement covers your permitted download, installation of these documents on your computer, and use of the INTERACT® Licensed Materials (defined below). BY SIGNING THIS LIMITED LICENSE AGREEMENT AND CLICKING ON THE "I AGREE" BUTTON AT <http://interact.fau.edu/agreement.aspx> AND PRESSING THE ENTER KEY, YOU ACKNOWLEDGE THAT YOU HAVE READ ALL OF THE TERMS AND CONDITIONS OF THIS AGREEMENT, UNDERSTAND THEM, AND AGREE TO BE LEGALLY BOUND BY THEM. If you do not agree with the terms of this Agreement and click the "I DISAGREE" button at <http://interact.fau.edu/agreement.aspx>, you may not download, install or use the INTERACT® Licensed Materials. As used in this Agreement, "INTERACT® Licensed Materials" means the INTERACT® documents downloaded from this website in electronic (pdf, Word, Excel etc.) or written format and the INTERACT® trademark.

1. DEFINITIONS.

- a. "INTERACT Licensed Intellectual Property" shall mean collectively the INTERACT Licensed Marks and INTERACT Licensed Copyrighted Material.
- b. "INTERACT Licensed Marks" shall mean the term "INTERACT" and formatives thereof, both with and without graphical components, as used with goods and services relating to interventions to reduce acute care transfers from health care facilities, and specifically including the Registered Trademark protected by US Registration No. 4,236,059 (the "Registered Trademark").
- c. "INTERACT Licensed Materials" shall mean: (i) Appendix A for INTERACT Tools for Skilled Nursing and any updates, releases or subsequent versions thereto, which contain and embody INTERACT Licensed Intellectual Property including INTERACT Licensed Copyrights and/or INTERACT Licensed Trademarks.

2. FEES. Educational use of INTERACT® Licensed Materials is provided without charge, but use and access of these materials is contingent on following the terms of this Agreement.

3. GRANT OF LICENSE. Subject to the terms and conditions of this Agreement, Pathway grants to you a limited, non-exclusive, non-transferable license (the "INTERACT® Tools For Nursing Homes") to download, install and use the INTERACT® Licensed Materials solely for your educational purposes. Pathway shall retain all title, copyright,

INTERACT FOR SKILLED NURSING LICENSE AGREEMENT

trademark rights, and other intellectual proprietary rights in, and ownership of, the INTERACT® Licensed Materials regardless of the media upon which the original or any copy may be recorded or fixed. Any rights in INTERACT® Licensed Materials not granted herein are expressly reserved by Pathway.

4. **SCOPE OF USE.** Your use of the INTERACT® Licensed Materials may not exceed the applicable use restrictions under this Agreement.
5. **OTHER RESTRICTIONS. THESE INTERACT® LICENSED MATERIALS MAY NOT BE RESOLD OR USED AS CONTENT OR ADVERTISING FOR COMMERCIAL (FEE FOR SERVICE) TRAINING SEMINARS, WEBINARS, OR CONSULTING SERVICES; THESE MATERIALS MAY NOT BE INCORPORATED INTO SOFTWARE, INCLUDING BUT NOT LIMITED TO ELECTRONIC HEALTHCARE RECORD SYSTEMS; NO REVERSE ENGINEERING.** You shall not directly or indirectly: (i) sell, lease, redistribute or transfer any of the INTERACT® Licensed Materials, whether in printed or electronic form; (ii) modify, create software programs based on, translate, create derivative works based on, sublicense, or distribute any of the INTERACT® Licensed Materials; (iii) rent, lease or license any rights in any of the INTERACT® Licensed Materials in any form to any person; (iv) you may not use any INTERACT® Licensed Materials for the benefit of any third parties or in any way other than your internal operations and internal business purposes; (v) or remove, alter or obscure any proprietary or copyright or trademark notices, labels, or marks on or within the INTERACT® Licensed Materials or any copies thereof; (vi) use INTERACT® Tools for Assisted Living or use INTERACT® Tools for Home Health Care are not permitted without a separate license agreement. You are responsible for all use of the INTERACT® Licensed Materials and for any downloading, installing and using the INTERACT® Licensed Materials and for compliance with this Agreement; any breach by you or any user shall be deemed to have been made by you. This Agreement does not transfer to you any title or any ownership right or interest in any INTERACT® Licensed Materials or in any other intellectual property rights of Pathway or Florida Atlantic University. You acknowledge that the INTERACT® Licensed Materials and that the trademark INTERACT® used alone and with associated logos as in US Registration No. 4,236,059, as used in connection with these products is owned by Florida Atlantic University. You are not permitted to make any use of or alteration to the INTERACT® trademarks beyond the terms of this Agreement without the written authorization of Pathway. Printing by a third party print vendor is permissible, provided that the INTERACT licensed materials are not altered, that the INTERACT trademark and footer are present, that no 3rd party trademark is applied, and that what you print is only for your internal and educational use and that you print no more than is necessary for your own internal use.
6. **TECHNICAL SUPPORT.** No technical support or guidance for use will be provided by Pathway concerning the proper use of INTERACT® Licensed Materials beyond this license agreement.
7. **WARRANTY AND DISCLAIMER.** INTERACT® LICENSED MATERIALS, AND ANY OTHER DOCUMENTATION, MATERIALS AND/OR DATA PROVIDED BY PATHWAY ARE PROVIDED "AS IS" AND "WITH ALL FAULTS," AND

INTERACT FOR SKILLED NURSING LICENSE AGREEMENT

PATHWAY EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES OF ANY KIND OR NATURE, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF OPERABILITY, CONDITION, TITLE, NON-INFRINGEMENT, NON-INTERFERENCE, QUIET ENJOYMENT, VALUE, ACCURACY OF DATA, OR QUALITY, AS WELL AS ANY WARRANTIES OF MERCHANTABILITY, WORKMANSHIP, SUITABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR THE ABSENCE OF ANY DEFECTS THEREIN, WHETHER LATENT OR PATENT. NO WARRANTY IS MADE BY PATHWAY ON THE BASIS OF TRADE USAGE, COURSE OF DEALING OR COURSE OF TRADE. PATHWAY DOES NOT WARRANT THAT THE INTERACT® LICENSED MATERIALS OR ANY OTHER INFORMATION, MATERIALS, DOCUMENTATION OR TECHNOLOGY PROVIDED UNDER THIS AGREEMENT WILL MEET YOUR REQUIREMENTS OR THAT THE OPERATION THEREOF WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT ALL ERRORS WILL BE CORRECTED. YOU ACKNOWLEDGE THAT PATHWAY'S OBLIGATIONS UNDER THIS AGREEMENT ARE FOR YOUR BENEFIT ONLY. Pathway makes no warranty associated with the use of INTERACT® Licensed Materials to change the clinical outcome or aggregate re-hospitalization rates for Long Term Care Facilities or other health care facilities or health care practitioners that choose to utilize INTERACT® Licensed Materials.

8. LIMITATION OF LIABILITY. IN NO EVENT WILL PATHWAY BE LIABLE FOR NEGLIGENCE, STRICT LIABILITY, BREACH OF CONTRACT, MISREPRESENTATION AND OTHER CONTRACT OR TORT CLAIMS ARISING FROM OR RELATED TO THIS AGREEMENT, OR THE USE OF THE INTERACT® LICENSED MATERIALS.
9. GOVERNING LAW; ARBITRATION. This Agreement shall be governed in all respects by the laws of the State of Minnesota, USA, without regard to choice-of-law rules or principles.
10. SEVERABILITY. If any provision of this Agreement is held to be illegal or unenforceable for any reason, then such provision shall be deemed to be restated so as to be enforceable to the maximum extent permissible under law, and the remainder of this Agreement shall remain in full force and effect.
11. ASSIGNMENT. You may not assign or otherwise transfer this Agreement without Pathway's prior written consent.
12. COUNTERPARTS. This Agreement may be executed in any number of duplicate originals and each such duplicate original shall be deemed to constitute one and the same instrument.

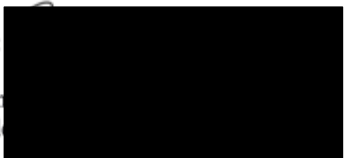
INTERACT FOR SKILLED NURSING LICENSE AGREEMENT

IN WITNESS WHEREOF, the parties have executed this Limited License Agreement by their duly authorized representatives as of the day and year first above written.

PATHWAY HEALTH SERVICES INC.

By:

Name:
Title:



INDIVIDUAL

By:

Name: Nohely Macias



Educational Institution:
Southern California CSU DNP Consortium;
California State University, Fullerton;
California State University, Long Beach; &
California State University, Los Angeles

Date: Apr 26, 2022

Date: Apr 25, 2022

INTERACT FOR SKILLED NURSING LICENSE AGREEMENT

Appendix A

INTERACT TOOLS FOR NURSING HOMES**Overview Figure**

Overview of INTERACT Program and Tools

Implementation Guide**Quality Improvement Tools**

Hospitalization Rate Tracking Tool

Quality Improvement Tool for Review of Acute Care Transfers

Quality Improvement Summary

For Communication within the Nursing Home

Stop and Watch Early Warning Tool

SBAR Communication Tool and Change in Condition Progress Note

“Medication Reconciliation Worksheet for Post-Hospital Care”

For Communication between Nursing Home and Hospital

Engaging Your Hospitals

Nursing Home Capabilities List

NH – Hospital Transfer Form

NH- Hospital Data List

Acute Care Transfer Checklist

Hospital – Post-Acute Care Data List and Sample Form

Decision Support Tools

Acute Change in Condition File Cards

Care Paths

Acute Mental Status Change

Change in Behavior New or Worsening Behavior Symptoms

Dehydrations

Fever

GI Symptoms (Nausea, Vomiting, Diarrhea)

Shortness of Breath

Symptoms of CHF

Symptoms of Lower Respiratory Illness

Symptoms of UTI

Advance Care Planning Tool

Advance Care Planning Tracking Tool

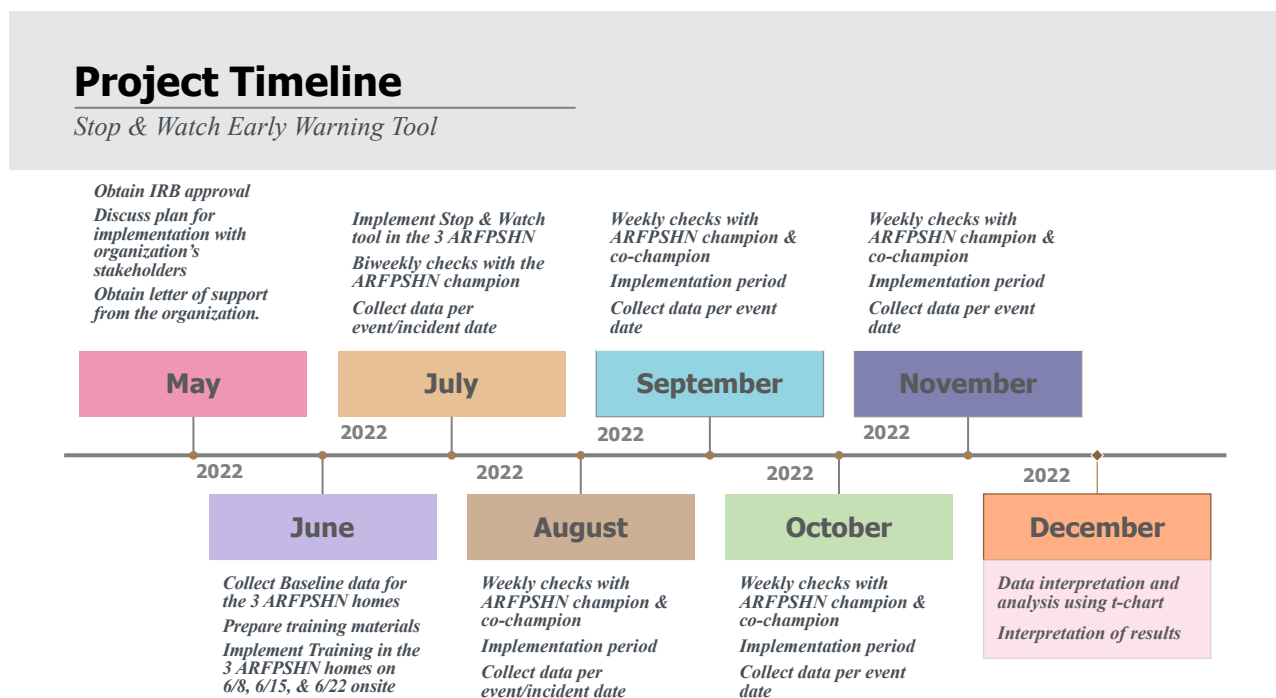
Advance Care Planning Communication Guide

Identifying Residents Appropriate for Hospice or Comfort Care

Comfort Care Order Set

Appendix J

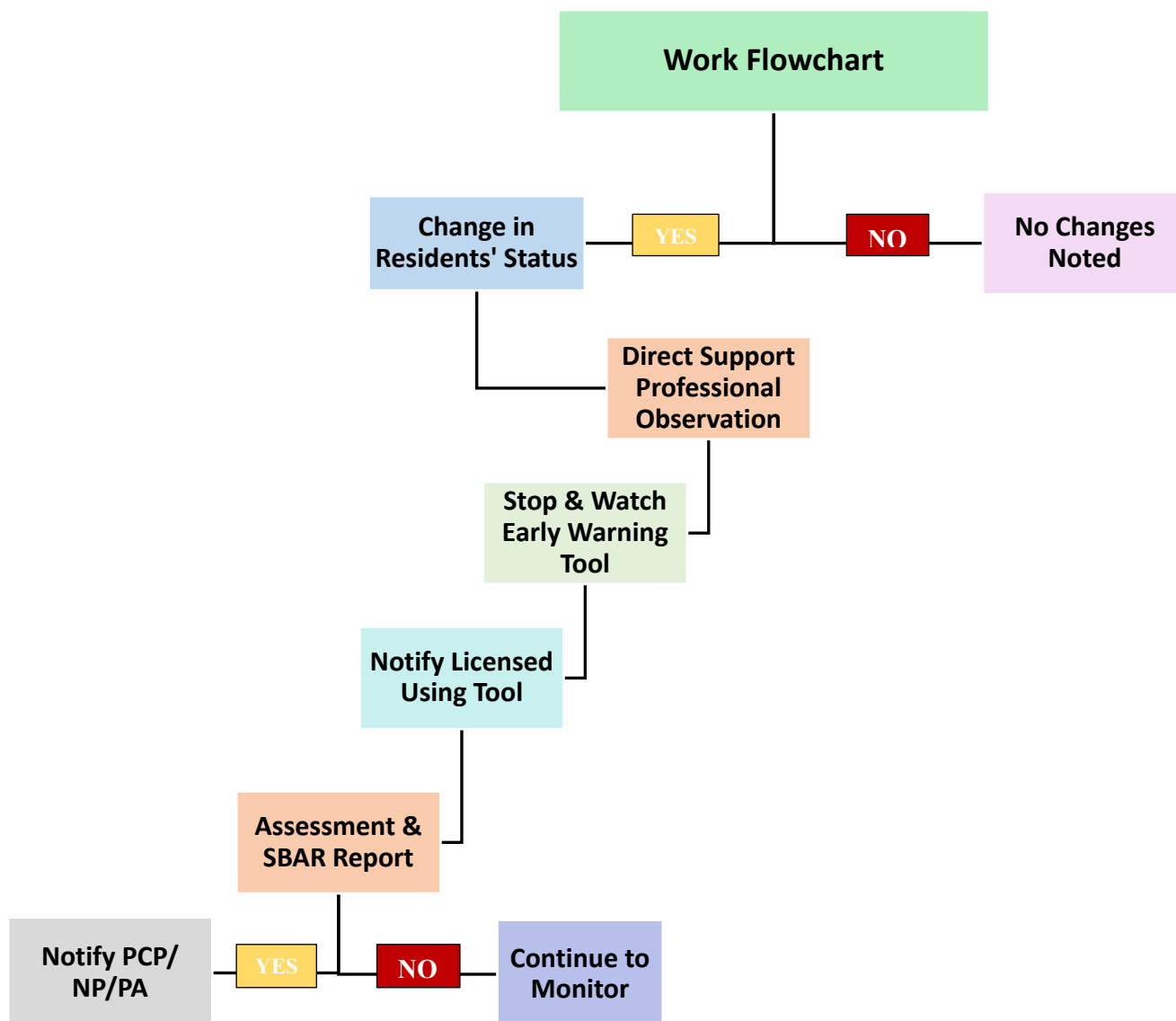
Tentative Project Timeline



Note: Dates for the project's phases were subject to changes upon IRB's approval contingency.

Appendix K

Stop & Watch Early Warning Tool and SBAR Communication Tools Work Flowchart



Appendix L

Figure 1

INTERACT MODEL 4.5 Acute Care Transfer Log

Acute Care Transfer Log



You can use this tool as a worksheet for recording all acute care transfers during a month. Print more pages as needed. This tool is not necessary if you use the **INTERACT Hospitalization Rate Tracking Tool**, which allows you to enter the data directly into an Excel spreadsheet, and calculates rates and generates reports. A similar tracking tool is available through the National Nursing Home Quality Improvement Campaign at www.nhqualitycampaign.org

SNF/NF Name _____ Month/Year _____ / _____

Resident/ ID	Date of Most Recent Admission to Facility	Admitted to Facility from ¹ (circle)	Status on Admission ² (circle)	Date of Acute Care Transfer	Time of Transfer (circle AM or PM)	Outcome of Transfer ³ (circle)	Reason for Transfer ⁴
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	
	/ /	Hosp H O	PAC LTC	/ /	AM PM	IP OBS ER	

1 Hosp = acute care hospital; **H** = home; **O** = Other location

2 PAC = post-acute care (most often Medicare Part A skilled care) for rehabilitation and/or management of medical or post-surgical conditions; **LTC** = long-term care

3 IP = admitted as an inpatient; **OBS** = admitted on observation status; **ER** = emergency room visit only with return to the facility (includes residents who die in the ambulance or ER) **4**

Examples of options on the above referenced Tracking Tools: Bleeding, Cellulitis, Chest Pain, HF, COPD, Dehydration/Electrolyte Imbalance, Fall, GI (vomiting, diarrhea, pain), Pneumonia/Respiratory Infection, Seizure, Sepsis, Shortness of Breath, UTI, Other

©2014-2021 Version 4.5, Florida Atlantic University, all rights reserved. This document is available for clinical use, but may not be resold or incorporated in software without permission of Florida Atlantic University.

Note: Used with permission from Pathway Health Services Inc.

Figure 2

INTERACT MODEL 4.5 INTERACT Quality Improvement Tool for Review of Acute Care Transfers

Quality Improvement Tool For Review of Acute Care Transfers



The **INTERACT QI Tool** is designed to help your team analyze hospital transfers (including ER visits, observation stay and admissions) and identify opportunities to reduce transfers that might be preventable. Complete this tool for each or a representative sample of hospital transfers in order to conduct a root cause analysis and identify common reasons for transfers. Examining trends in these data with the **INTERACT QI Summary Tool** can help you focus educational and care process improvement activities.

Patient/Resident _____ Age _____

Date of most recent admission to the facility _____/_____/_____

Primary goal of admission: Post-acute care Long-stay Others: _____

SECTION 1: Risk Factors for Hospitalization and Readmission

a. Conditions that put the resident at risk for hospital admission or readmission:

- | | |
|--|---|
| <input type="checkbox"/> Cancer, on active chemo or radiation therapy | <input type="checkbox"/> Infection with ongoing Treatment |
| <input type="checkbox"/> Heart Failure (HF) | <input type="checkbox"/> High Risk Medications |
| <input type="checkbox"/> Congestive Obstructive Pulmonary Disease (COPD) | <input type="checkbox"/> Anticoagulant <input type="checkbox"/> Diabetic Agent <input type="checkbox"/> Opioids |
| <input type="checkbox"/> Dementia | <input type="checkbox"/> Multiple active diagnoses and/or co-morbidities
(e.g. HF, COPD and Diabetes in the same patient/resident) |
| <input type="checkbox"/> Diabetes | <input type="checkbox"/> Polypharmacy (e.g. 9 or more medications) |
| <input type="checkbox"/> End-Stage Renal Disease | <input type="checkbox"/> Surgical complications |
| <input type="checkbox"/> Fracture (Hip) | |

b. Was Patient/Resident hospitalized in the **30 days before their most recent admission to the facility**? No Yes (list dates and reasons)
(Other than the one being reviewed in this tool)

c. Other hospitalizations or emergency department visits in the **past 12 months**? No Yes (list dates and reasons)
(Other than the one being reviewed in this tool)

SECTION 2: Describe the Acute Change in Condition and Other Non-Clinical Factors that Contributed to the Transfer

a. Date the change in condition first noticed _____/_____/_____

b. Briefly describe the change in condition and other factor(s) that led to the transfer and then check each item below that applies

c. Vital signs at time of transfer

Temp _____ Pulse _____ Pulse Ox (if indicated) _____% on Room Air O₂ (_____)

Respiratory rate _____ BP _____/_____ Glucose (diabetics) _____

© 2014-2021 Version 4.5, Florida Atlantic University, all rights reserved.
This document is available for clinical use, but may not be resold or incorporated in software without the permission of Florida Atlantic University.

Note: Used with permission from Pathway Health Services Inc.

Quality Improvement Tool

For Review of Acute Care Transfers (cont'd)



d. Check all that apply

New or Worsening Symptoms or Signs

- Abdominal distention/suspected bowel obstruction
- Abdominal Pain
- Abnormal vital signs (low/high BP, high/low respiratory rate)
- Altered mental status
- Behavioral symptoms (e.g. agitation, psychosis)
- Bleeding (other than GI)
- Cardiac arrest
- Chest pain
- Constipation
- Cough
- Dehydration/volume depletion
- Diarrhea
- Dizziness/vertigo
- Edema (new or worsening)
- Fall
- Fever
- Food and/or fluid intake (decreased or unable to eat and/or drink adequate amounts)
- Function decline (worsening function and/or mobility)
- GI bleeding, blood in stool
- Hematoma
- Hypertension (uncontrolled)
- Hypoxia – (low p O₂<90)
- Loss of consciousness (syncope, other)
- Nausea/vomiting
- Pain (uncontrolled)
- Respiratory arrest
- Respiratory infection (bronchitis, pneumonia)
- Shortness of breath
- Seizure
- Skin wound or pressure ulcer/injury
- Stroke / TIA /CVA
- Trauma (fall-related or other)
- Unresponsive
- Urinary incontinence
- Weight loss
- Other (describe) _____

Abnormal Labs or Tests Results

- Blood sugar (high)
- Blood Sugar (low)
- COVID (Positive)
- EKG
- Hemoglobin or hematocrit (low)
- INR (high)
- Kidney function (BUN, Creatinine)
- Pulse oximetry (low oxygen saturation)
- Urinalysis or urine culture
- White blood cell count (high)
- X-ray
- Other (describe) _____

Diagnosis or Presumed Diagnosis

- Acute renal failure
- Anemia (new or worsening)
- Asthma
- Cellulitis
- COPD (Chronic Obstructive Pulmonary Disease)
- COVID
- DVT (Deep Vein Thrombosis)
- Fracture (site: _____)
- HF (Heart Failure)
- Pneumonia
- Sepsis
- UTI (Urinary Tract Infection)
- Other (describe) _____
- Need for diagnostic and other procedures including transfusions
 - Gastrostomy tube blockage or displacement
 - Transfusion (planned)
 - Other (describe) _____

Other Factors Contributing to the Transfer

- Advance directive not in place
- Clinician insisted on transfer despite staff willing to manage in facility
- Direct admission (from dialysis or other specialty office)
- Discharged from the hospital too soon
- Family members/representative preferred or insisted on transfer
- Planned admission (for surgery or other procedure)
- Resident preferred or insisted on transfer
- Resources to provide care in the facility were not available
- Other (describe) _____

Note: Used with permission from Pathway Health Services Inc.

Quality Improvement Tool

For Review of Acute Care Transfers (cont'd)



SECTION 3: Describe Action(s) Taken to Evaluate and Manage the Change in Condition Prior to Transfer

a. Briefly describe how the changes in Section 2 were evaluated and managed and check each item that applies

b. Check *all* that apply

Tools Used

- Stop and Watch
 - SBAR
 - Care Path(s)
 - Change in Condition File Cards
 - Transfer Checklist
 - Acute Care Transfer Form (or an equivalent paper or electronic version)
 - Advance Care Planning Tools
 - Infection or Sepsis Guidance
 - Other Structured Tool or Form (describe)
-

Medical Evaluation

- Telephone only
- NP or PA visit
- Physician visit
- Other (e.g. in a specialist office or while on dialysis)

Testing

- Blood tests
 - EKG
 - Urinalysis and/or culture
 - Venous doppler
 - X-ray
 - Other (describe)
-

Interventions

- New or change in medication(s)
 - IV or subcutaneous fluids
 - Increase oral fluids
 - Oxygen (if available)
 - Other (describe)
-

c. Were **advance care planning or advance directives** considered in evaluating/managing the change? (e.g. orders for Do Not Resuscitate (DNR), Do Not Intubate (DNI), palliative or hospice care, other such as POLST, MOLST or POST): No Yes

If **yes**, were the relevant advance directives (check only one):

- Modified as a result of this change in clinical condition/transfer?
- Already in place and documented?
- New as a result of this change in clinical condition/transfer?

Describe

Note: Used with permission from Pathway Health Services Inc.

Quality Improvement Tool

For Review of Acute Care Transfers (cont'd)



SECTION 4: Describe the Hospital Transfer

a. Date of transfer _____ / _____ / _____ Day _____ Time (am/pm) _____

- b. Clinician authorizing transfer: Primary physician Covering physician NP or PA Other (specify) _____
 ED visit only Held for observation Admitted to hospital as inpatient

c. Outcome of transfer: _____

Hospital diagnosis(es) (if available) _____

d. Resident died in ambulance or hospital: No Yes Unknown

e. Factors contributing to transfer (check all that apply and describe)

- Advance directive not in place Family members/representative preferred or insisted on transfer
 Clinician insisted on transfer despite staff willing to manage in the facility Planned admission (for surgery or other procedure)
 Direct admission (from dialysis or other specialty office) Resident preferred or insisted on transfer
 Discharged from the hospital too soon Resources to provide care in the facility were not available

SECTION 5: Identify Opportunities for Improvement

a. In retrospect, does your team think this transfer might have been prevented? No Yes (describe) _____

If yes, check one or more that apply:

- The new sign, symptom, or other change might have been detected earlier
 Changes in the resident's condition might have been communicated better among facility staff, with physician/NP/PA, or other health care providers
 The condition might have been managed safely in the facility with available resources
 Resources were not available to manage the change in condition safely or effectively despite staff willing to manage in the facility (check all that apply)
 On-site primary care clinician Staffing Lab or other diagnostic tests
 Pharmacy services Other (describe) _____
 Resident and family or resident representative preferences for hospitalization might have been discussed earlier
 Advance directives and/or palliative or hospice care might have been put in place earlier
 Discharged from the hospital too soon
 Other (describe) _____

b. In retrospect, does your team think this resident might have been transferred sooner? No Yes (if yes, describe) _____

c. After review of how this change in condition was evaluated and managed, has your team identified any opportunities for improvement?
 No Yes (describe specific changes your team can make in your care processes and related education as a result of this review) _____

Name of person completing form _____ Date of completion _____ / _____ / _____

Note: Used with permission from Pathway Health Services Inc.

Appendix M

Table 1

Baseline Data Implementation Potentially Avoidable Hospitalization & Emergency Department Visits Without Hospitalizations Rates

Variable	<i>n</i>	%
<i>PAH</i>		
PNA	7	28%
UTI	6	24%
Sepsis	12	48%
<i>EDV</i>		
PNA		
UTI	4	80%
Seizures	1	20%
Sepsis		

Note. EDV = Emergency department visits without hospitalization, PAH = potentially avoidable hospitalizations, PNA = Pneumonia, UTI = Urinary Tract Infection. Total of 5 emergency department visits without hospitalization during this period.

Table 2

Post-Intervention Data of Potentially Avoidable Hospitalization & Emergency Department Visits Without Hospitalization Rates

Variable	<i>n</i>	%
<i>PAH</i>		
PNA		
UTI	2	25%
UTI & PNA	1	12.5%
Sepsis	5	62.5%
<i>EDV</i>		
PNA		
UTI	1	50%
Undiagnosed	1	50%
Sepsis		

Note. EDV = Emergency department visits without hospitalization, PAH = potentially avoidable hospitalizations, PNA = Pneumonia, UTI = Urinary Tract Infection. During this period there were two unplanned emergency department visits without hospitalization reported, measures were not implemented for those.

Table 1*Residents Demographics*

Variable	<i>n</i>	%
<i>Ethnicity</i>		
Hispanic	3	27%
Caucasian	6	55%
Asian	1	9%
Unknown	1	9%
<i>Gender</i>		
Female	7	64%
Male	4	36%
<i>Age</i>		
20-35	3	27%
36-51	1	9%
52-67	7	64%

Note: Total of 11 residents from the ARFPSHN homes.

Table 2*Residents Medical Characteristics*

Variable	n	%
<i>Diagnosis</i>		
Profound Intellectual Disabilities	11	100%
Cerebral Palsy	4	40%
Seizures	7	60%
Hyperlipidemia	6	60%
DM 2	1	10%
CHF	2	20%
HTN	2	20%
Osteoporosis	5	50%
Autism	1	10%

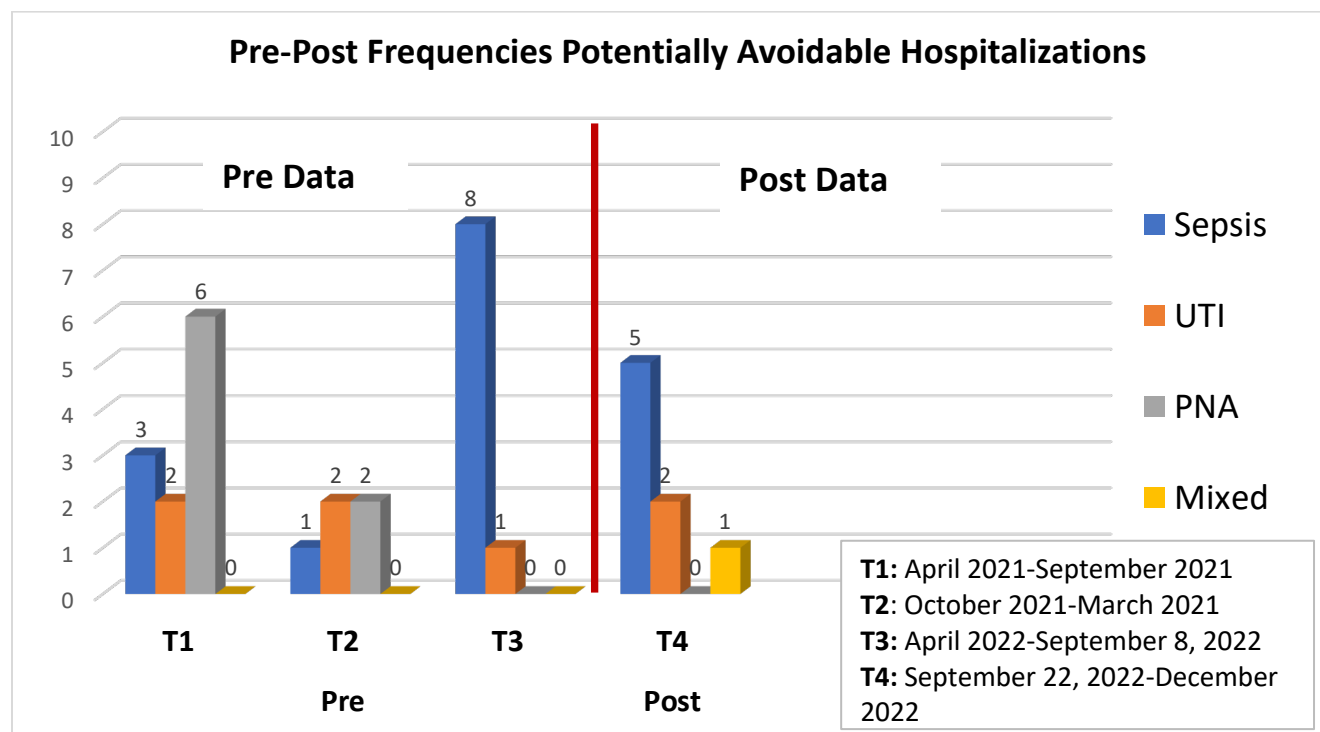
Note. $n = 11$, HTN = Hypertension, CHF = Congestive Heart Failure, DM2 = Diabetes Mellitus type 2.

Appendix O

Figure 9

Histogram Chart for Pre-and-Post Implementation Data for Potentially Avoidable

Hospitalization Rates

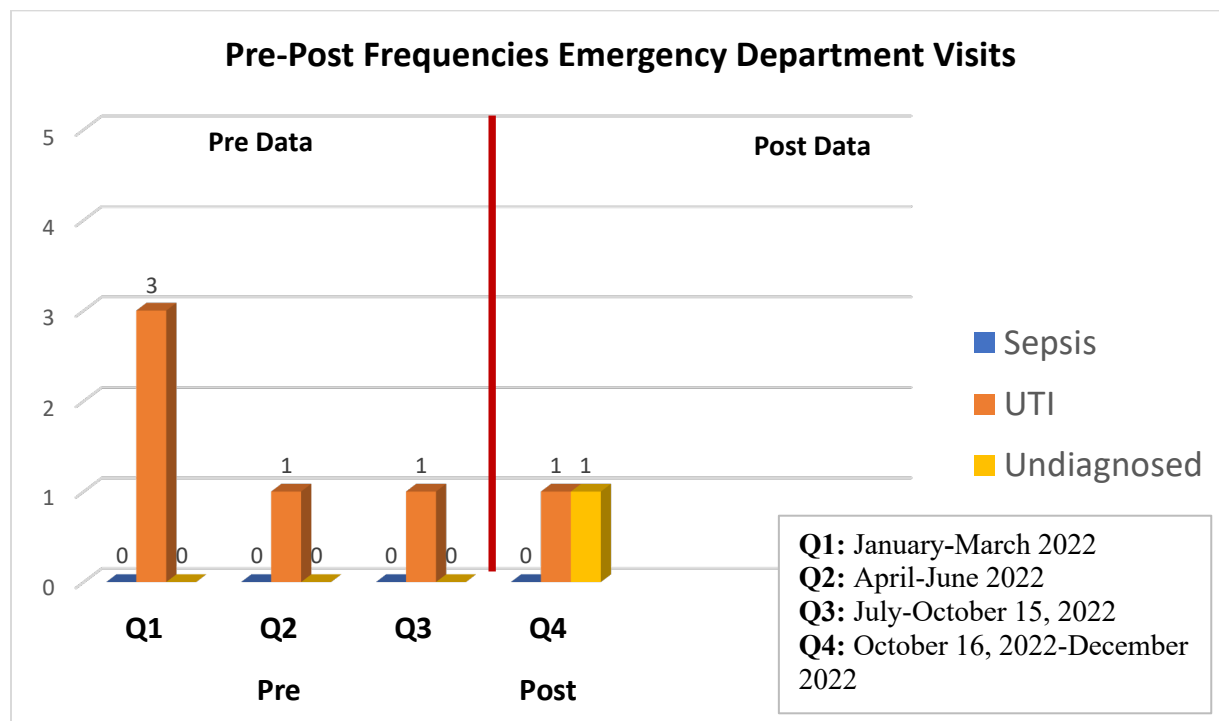


Note. Data from April 2021 to September 2022 before INTERACT tool implementation for baseline data. September to December 2022 post-intervention implementation for all 3 ARFPSHN homes.

Appendix P

Figure 10

Histogram for Pre-and-Post Intervention Data for Emergency Department Visits Without Hospitalization Rates



Note. Data from January 2022 to October 15, 2022, for baseline data and October 16, to December 2022, for post-training implementation for all three participating ARFPSHN homes. Measures were not used during post-intervention data.

Appendix Q

Table 1

Case-by-case Analysis for Potentially Avoidable Hospitalizations, Unplanned Emergency Department Visits, and Changes in Condition Incidents per participating facility

<i>ARFPSHN-A</i>	<i>Date</i>	<i>Diagnoses/ICD-10 Code</i>	<i>Measures</i>	<i>Intervention/Response</i>
PAH 1	9/30/22	Sepsis/ A41.9	None	Called 911
PAH 2	10/17/22	Sepsis/ A41.9	None	Called 911
PAH 3	11/5/22	Sepsis/ A41.9	SAW & SBAR	Called 911
PAH 4	11/15/22	UTI & PNA/ N39.0 & J18.9	SAW & SBAR	Called 911
PAH 5	12/6/22	Sepsis/ A41.9	SAW & SBAR	Called 911
EDV 1	10/15/22	Undiagnosed, not treated	None	Taken to ED, test completed not admitted. Sent back home without treatment or new orders.
Change in Condition 1	11/12/22	Change in bowel pattern	SAW & SBAR	Enhanced resident monitoring/ reported to staff
Change in Condition 2	11/13/22	Discoloration on eyelid	SAW	Enhanced resident monitoring/ reported to staff
<i>ARFPSHN-B</i>	<i>Date</i>	<i>Diagnoses/ICD-10 Code</i>	<i>Measures</i>	<i>Intervention/Response</i>
PAH 6	9/22/22	UTI/ N39.0	SAW & SBAR	Called 911
Change in Condition 3	9/9/22	Skin discoloration	SAW & SBAR	Enhanced resident monitoring/ reported to staff
<i>ARFPSHN-C</i>	<i>Date</i>	<i>Diagnoses/ICD-10 Code</i>	<i>Measures</i>	<i>Intervention/Response</i>
PAH 7	11/22/22	Sepsis/ A.41.9	None	Transported to ED

PAH 8	11/23/22	UTI/ N39.0	None	Transported to ED
EDV 2	11/23/22	UTI/ N39.0	None	Called 911, treatment prescribed
Change in Condition 4	12/12/22	Decrease appetite, discomfort, increase agitation	SAW & SBAR	Called PCP, ordered CBC, CMP, UA. No abnormal test result, continue to monitor

Note. EDV = Emergency department visits without hospitalization, PAH = potentially avoidable hospitalizations, SAW= Stop and Watch Tool Early Warning Tool, PNA = Pneumonia, ED= Emergency Department, CMP= Complete Metabolic Panel, UA= Urine Analysis, CBC= Complete Blood Count, PCP= Primary Care Physician.