2018

Intensive Care Admissions: Predicting Palliative Care Needs in the First 24 Hours

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Final DNP Project Report

Title

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Spring 2018

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Dedication

I dedicate this project to the following people who have each played significant roles in my life; to my sister, my friends and my in-laws. To my steadfast supportive husband, Andrew Harover, for continuing to encourage me through the most challenging moments of this program, for learning the nuances of Palliative care to become a public advocate and for turning my stressful moments into moments of reflection and smiles. To my father, Donald Miller, words will never express the gratitude I have for you investing in my future and cheering me on as I grow closer to my goals. Finally, to my 18-year-old self for identifying a dream, sticking with it and making it a reality.

Acknowledgements

Committee chair and advisor Melanie Hardin-Pierce. Committee members Chizimuzo Okoli and Karen Hill. UK Support Staff: Amanda Thaxton Wiggins and Whitney Kurtz-Ogilvie. Clinical preceptors: Anne Hickman, Hender Rojas and Jackie Bradshaw. Baptist Health Lexington.

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Abstract

PURPOSE: The purpose of this retrospective analysis was to determine the proportion of intensive care admissions that required palliative care services during the same admission assessed by an investigator-developed palliative care screening tool. This study also analyzed the screening tool for the number of criteria producing the highest sensitivity and specificity for a palliative care consult occurring during the same hospital stay.

METHODS: Retrospective data collection and analysis were performed by randomly selecting 110 patients records from a report obtained through the electronic health record, Epic. The sample was drawn from patients admitted to a medicine intensive care unit (2A) and neurology/neurosurgical intensive care unit (2B) at Baptist Health in Lexington Kentucky, a community-based tertiary care hospital, between April and August 2017.

RESULTS: Screening tool items capturing more than one trigger point produced the highest sensitivity and specificity under a ROC curve (.7/.422) resulting in a palliative care consultation during the same hospital stay. The utilization of palliative consultations when criteria on the tool was triggered was low at 20/79 (25.3%) patients. A palliative consult, when indicated, was carried out a median of 5.5 days after the initial admission to the intensive care unit. Missed opportunities for palliative consults were discovered with 8 out of the remaining 59 patients who warranted, but did not receive a consult, died since the reviewed ICU admission.

CONCLUSION: Palliative care consultations within the first twenty-four hours of an intensive care admission are needed but carried out at a low rate. The investigator-developed screening tool was effective in identifying the need for palliative care consultation. Palliative care screening tools need further validity testing as no standardize tool currently exists. Customizing tools for individual facility use is recommended and additional criteria should be considered.

Introduction

As aggressive treatment options to extend life evolve, intensive care units (ICU) become costlier. It is estimated that 20% of those admitted to an ICU die during or shortly after admission (The Dartmouth Atlas of Health Care, 2014). Palliative care (PC) is a service proven to decrease length of hospital stay, increases family satisfaction and is a cost saving practice focused on establishing patients' goals of care while providing symptom management (World Health Organization, 2015). Major healthcare organizations such as the American Association of Critical-Care Nurses support the need for early identification of patients who need PC by extending PC services into the ICUs early in treatment plans (Nelson, Curtis, Mulkerin, Campbel, Lustbader, Mosenthal, et al., 2013). In fact, PC within the ICU setting is now a quality improvement strategy for patients with advanced chronic illnesses (Institute of Healthcare Improvement, 2009). Identifying patients best suited for PC services in ICUs is challenging as a standardized screening tool and time frame for application does not currently exist.

Background

Benefits of Palliative Care in Intensive Care Units

Palliative care functions as a cost avoidance service by establishing goals of care with patients and families often resulting in fewer aggressive treatments or readmissions (Jenko, Adams, Thompson, and Bailey, 2015). Early utilization of PC correlates with a direct cost savings (cost avoidance) per patient without an increase in mortality (Scibetta, Kerr, Mcguire, Rabow, 2015). Palliative care patients are also less likely to be readmitted to ICUs and have fewer emergency department visits, further increasing cost avoidance (Penrod, Deb, Dellenbaugh, Burgess, Zhu, Christiansen et al, 2010). Improved quality outcomes, such as

patient satisfaction and decreased pain, are reported when PC is used in ICUs providing further monetary relief for the facilities utilizing the service (Penrod et al., 2010).

Daily rounding is now common practice within ICUs to establish an appropriate multidisciplinary patient-centered treatment plan (Moroney and Knowles, 2006). However, daily rounds may occur outside patients' rooms excluding them from the formation of plans. Palliative care can bridge the communication gaps between multiple disciplines by supporting a team-based approach and establishes shared decision making with the patients' wishes at the forefront (Campbell, Weissman, Nelson, 2012; Meier, 2011). "Supporting the ICU medical team in making clinically, ethically and emotionally challenging decisions" is a documented objective of a PC consultation (Campbell, Weissman and Nelson, 2012). The service can also provide support for family members during emotionally challenging situations as they care for patients with a terminal trajectory.

Timeliness of Use

The *Triple Aim Initiative* (2009), is a theoretical framework posited by the Institute for Healthcare Improvement. The framework may be applied to discover ways to decrease healthcare costs with earlier initiation of palliative care consultation (PCC). Many studies performed indicate early initiation of PC within the ICU for best outcomes, but the definition of 'early' varies among researchers. A retrospective chart review by May, Garrido, Essel, Kelly et al. (2017) reported an overall cost reduction of 14% ($1,312) per patient when PC joined the treatment team within six days of admission and a savings of 24% ($2,280) if PC services was initiated within two days of an ICU admission. The significant savings with an initiation difference of 4 days implies that 'time really is money'. Improvements such as length of stay and

decreased mortality were also found to be most positively affected when PC was initiated within the first 48 hours of admission to ICUs (Bharadwaj, Helfen, Delon, Thompson, Ward, Patterson et al., 2016). Because the initiation of PC services currently lacks standardized timing, variations in beginning the service within ICU's can continue to hinder appropriate patient care.

Screening Tools

Because the role of PC encompasses a magnitude of services, no two screening tools are alike, and no gold standard tool exists. Edmonton Symptom Assessment tool has been studied in ICUs, and focuses on triggering consultations based on severity of symptoms (Hui, Titus, Curtis, Ho-Nguyen, Frederickson, Wray et al., 2017). Other tools focus on identifying PC needs using diagnoses indicated to have high mortality and readmission rates (Jenko, Adams, Johnson, Thompson and Bailey, 2015; Creutzfeldt, Engelber, Healey, Cheever, Becker, Holloway et al., 2015). Despite the variation in approach, evidence supports the need for customized tools for facility use (Creutzfeldt et al., 2015; Hui et al., 2017; Jenko et al., 2015). Patient population and specialty services differ between facilities and a customized tool may be more sensitive in capturing the appropriate patients needing PC services in ICUs.

Purpose

The purpose of this study was to determine if the need for PCC can be predicted within the first 24 hours of an intensive care admission using an investigator-developed screening tool containing high mortality indicators. The study's objectives were to 1) retrospectively assess patient data with the created PC screening tool to determine the proportion of ICU admissions that used PC services during the same admission and 2) determine the number of criteria

producing the highest sensitivity and specificity indicating correlation to receipt of PCC during the same hospital stay for patients who were admitted or transferred to the ICU during their stay.

Methods

Setting

Institutional review board (IRB) approval was obtained from the University of Kentucky and Baptist Health Lexington (BHLex) prior to data collection. Baptist Health is a leading healthcare system in Kentucky and Indiana including eight main hospitals and many express care centers offering its consumers a wide range of medical services. BHLex, the focused location of this study, is a 391-bed tertiary care facility known for major medical research and education in Lexington, Kentucky. Established in 1999, BHLex's palliative program is accredited by the Joint Commission and was at the time of data collection BHLex has been on the forefront of innovation and care, leading the system to continue to improve their inpatient hospital PCC service, outpatient PC clinic and perinatal PC program. The concentration of this study is on BHLex's inpatient hospital PCC service. Medical records were reviewed from previous patients in 2A, BHLex's 21- bed medicine ICU and 2B, its 19-bed neurology/neurosurgery ICU.

Sample

The sample consisted of 110 medical records of patients admitted to 2A and/or 2B ICU between April 2017 and August 2017. A power analysis was performed and found using 210 charts was needed for statistical significance. However, 110 charts were available for review within the timeframe given for the principal investigator to conduct the study. The maximum margin of error on the estimate of patients detected by the screening tool, was calculated to be less than 10% with the sample size of 110 charts.

For the purposes of the current study, admissions included all patients accepted for care by the intensivist group or attendings of any specialty with ICU admission privileges at BHLex. Admissions were not limited to emergency room patients, but also included outside facility transfers, post-operative surgical patients, and transfers from medical surgical/telemetry floors following a decline in status. Included patients also had to be discharged between April 2017 and August 2017, be between 55-89 years of age, and could not be currently admitted at the time of review. This study did not focus on any specific gender or ethnicity. Exclusion criteria for patient selection were: non-English speaking patients, pregnant women of any gestation, admissions to 2H (BHLex's Cardiothoracic surgery ICU), admissions to 2A or 2B with total admission time less than 24 continuous hours, admissions to 2A &/or 2B with existing PCC, admissions to 2A &/or 2B with existing Hospice of the Bluegrass consultations, or those who receive Hospice consults within the first 24 hours of admission to the ICUs. Post-operative patients having planned or unplanned Carotid Endarectomys (CEA), Femoral Popliteal Bypass, Femoral Bypass, Bronchosopy/Thoracotomys and Transcatheter aortic valve replacements were also excluded as their estimated hospital length of stay is less than 48 hours before they are discharged home. The above mentioned surgical patients were only included if their ICU stay occurred longer than 48 continuous hours.

Instrument

Because a standardized palliative care screening tool does not currently exist and research emphasizes developing a tool specific to each facilities patient population, an investigator-developed screening tool was used for this study. Criteria used for the tool were identified by conducting a literature review of published studies (see Figure 5). A total of ten articles were included in the literature review, and the screening criteria used in each of these studies was

compiled into a master list (see Figure 1 & 2). As many of the researchers used the same criteria to screen patients, the list identifies triggers used in multiple studies. All criteria in the tables are those with documented high mortality rates producing increased hospital lengths of stay. The listed criteria are also supported by expert opinions and national standards; which indicate that, the included diagnoses, result in PC needs (Lapp and Iverson, 2015).

From the produced master list, the primary investigator evaluated mortality rates of each criteria point and chose those criteria with the highest rates for the tool. The admission protocol for 2A & 2B was reviewed and diagnoses expected to be admitted to the units were included on the tool with emphasis on end-stages of disease processes. Many criteria points were consolidated into one item on the investigator-developed tool due to redundancy of the items. Other items were excluded because they were not expected to be documented within the first twenty-four hours of admission, the timeframe observed for this study. After careful review, a total of 16 items were included on the tool(see Figure 3).

The document used for the study also includes a place to record admission diagnoses that are not one of the chosen sixteen screening items. The purpose of documenting all admission diagnoses was to further evaluate the specificity of disease processes prompting the need for PC. The screening document also notes if a PCC occurred during the hospital stay, and if so, it prompts the need to record the date to further evaluate the time it took to utilize the service. Finally, the disposition of each patient was recorded (either, deceased or still living) to assess the correlation between the tool's triggers and patient outcome. The completed screening document can be found in figure 3.

Timeframe

Researchers acknowledge better outcomes occur when PC needs are identified earlier in ICU admissions (Jenko et al, 2015; Walker, Mayo, Camire, Kearney, 2013; Zalenski, Jones, Courage, Waselewsky, Kostaroff, Kaufman, & Granovsky, 2017). The reviewed studies in which ICUs were screened,to identify PC needs, did so upon admission, and continued to screen patients daily, until either the tool triggered a consult or it was decided by providers that the need for PC did not exist. A benchmark timeframe for screening does not exist but colleagues Hurst, Yessayan, Mendez, Hammad, & Jennings (2018) were able to demonstrate that using a PC screening tool in the first twenty-four hours of an ICU admission, decreased time to consultation and increased the carrying out of PC consultations. These outcomes were replicated in a retrospective chart review, screening 201 medicine ICU patients using documentation from the first twenty-four hours of ICU admissions (Walker et. al, 2013). This study seeks to replicate the Hurst et al. (2018) and the Walker et al. (2013) outcomes by assessing the need for PC in the first twenty-four hours of ICU admission.

Data Collection

Access was given for the principal investigator to retrieve 110 medical records from the electronic health record, Epic ™, to screen eligible patients using the developed PCC tool. Using Epic, BHLex's computer information technology department retrieved data, which was then transferred to an excel document and sent via a secure email to the principal investigator. The excel document included patients' medical record number (MRN), name, date of birth, status class, admission date, coded admission diagnosis and unit from which the patient was discharged. Due to the limitations of Epic reports, the excel document included a total of 30,672

entries of all patients admitted and discharged to BHLex between April 2017-August 2017, in all patient statuses and departments. The data including emergency room, hospice, hospital outpatient, infusion services, inpatient, newborn, observation, outpatient, and surgery admissions statuses were initially sorted to view inpatient status only. Once sorted, 8,141 inpatient status entries remained. The sorted data appeared to be in ascending order based on medical record numbers but did not follow a strict ascending pattern. Patients were included in the report multiple times in consecutive order if they had multiple admissions within the reviewed time frame.

Patient charts were chosen at random choosing every fifth eligible medical record number to review for an ICU admission during their stay. Due to the limited information on the excel document, eligible MRNs consisted of patients between 55-89 years of age at the time of admission and did not have an excluded admission diagnosis as mentioned above such as pregnancy and cardiothoracic surgeries. The chosen patients' MRNs were entered into Epic electronic health record where their units of stay were reviewed. Once patients were found to have been admitted to 2A or 2B ICU; information on consults, admission history and physical notes and all charting within the first 24 hours of the intensive care admission were reviewed. If the patient met all inclusion and exclusion criteria, the investigator-developed PC screening tool was then completed based on the documented patient information within the first 24 hours of the ICU admission. The only exception to this documentation was recording the date of a PCC if one was obtained any time during the hospital stay.

Because private health information was not indicated for this study, each patient MRN was coded with a number for purposes of maintaining patient confidentiality. A total of 110 patients were found meeting all inclusion and exclusion criteria and eligible to screen. Once a

chart was screened, the results of the tool were input in Redcap for protected storage. Redcap is a secure online application used to manage online surveys and project databases. Redcap is supported in part by the National Institutes of Health and the information collected from BHLex's EHR put into the Redcap data base will be stored securely for the next six years.

Data Analysis

Descriptive statistics, such as frequency distributions, means and standard deviations (SD) were used to describe the patient demographics, if a consult occurred and the mortality rate of the patients screened. The 16 triggers within the tool were treated as categorical variables and a chi-squared test was performed to determine the number of triggers needed to produce the highest association with a PCC. A receiver operating characteristic (ROC) curve was also analyzed to summarize the sensitivity and specificity of the possible screening outcomes based on the different trigger point options chosen. All analysis was conducted using IBM SPSS Statistics software version 23 (Lexington, Ky).

Results

The sample consisted of 110 patient charts 55(50%) male and 55(50%) female while 94.5% of the sample were white and 5.5% black. The mean age of the sample was 71.8 years of age with a standard deviation of 8.3 (see Table 1). The two ICUs under review were represented equally, 57 patients (51.8%) deriving from the medicine ICU, 2A, and 53 (48.2%) from the neurology unit, 2B. Of the 110 patients in the sample, 31 patients did not have any indication for consult on their chart within first 24 hours of admission, 25% of the sample triggered one criteria point, 20% triggered 2, while 27% triggered 3-5 criteria on the tool. The most common diagnoses which did not indicate a consult, but resulting in mortality, were respiratory failure

secondary to pneumonia, sepsis/septic shock, gastrointestinal bleeding and complications from surgical interventions such as a stroke or hemorrhagic shock.

A total of 79 patients triggered at least one diagnosis or utilization point on the screening tool. The proportion of ICU admissions that triggered criteria on the screening tool, which resulted in a PCC during the same hospital stay, was 25.3% (Table 1). Of those who triggered a consult but did not receive one (n = 59), 8 of them died without receiving a PCC. Death of a patient was determined by reviewing the 'patient expiration' subsection of the EHR. Within the patient expiration section, the date of death was reviewed and recorded as either occurring during the reviewed ICU admission or after the reviewed admission.

Two or more criteria triggered on the tool produced a consult with the highest sensitivity. In the ROC curve analysis, the area under the curve (AUC) was 0.72 (CI=.61-.83; see Figure 4), suggesting that a cutoff of at least 2 triggers was significantly useful in determining whether the patient received a consult. Among those who received a consult, 70% had at least 2 triggers noted (sensitivity) and among those who did not receive a consult, 57.8% had less than 2 triggers (specificity) (see Table 2).

Discussion

Of the 20 patients receiving consultation, the criteria triggered on the tool was analyzed to determine the most predictive items. It was determined congestive heart failure (CHF) had the highest sensitivity resulting in a PCC 50% of the time, triggered by 10 of the 20 patients screened. Chronic obstructive pulmonary disease (COPD) and patients > 80 years old with 2 or more comorbidities were both the second most predicative criteria resulting in PCC, with 8/20 triggering the criteria. The least predictive items on the tool resulting in consultation were

'mechanical ventilation greater than 7 days' and 'family disagrees with plan of care (POC)'. The item on the tool 'family disagrees with plan of care (POC)', was never triggered by any of the 110 patients' charts reviewed; proposing the question if this criteria point should stay on the tool, and if documentation of such disagreements routinely occur within the first 24 hours of care.

The primary aim of this study was to predict the need for PC services within the first 24 hours of an ICU admission. The triggers chosen for the screening tool included diagnoses with high mortality, high readmission rates and extended lengths of stay. Even with previous research supporting the use of these diagnoses on the tool, the utilization of PC services when a trigger was indicated was low. This underutilization of PC services continues to be a problem in practice and can often be attributed to providers carrying out a curative plan of care, misunderstanding the mission of PC and the weight of opinion critical care nurses and support staff place on moving forward with PC services (Perrin and Kazanowski, 2015).

Earlier utilization of PC services in ICUs needs further investigation. Of the 20 patients within the study who both triggered and received a PCC, the median length of stay before a consult was carried out was 5.5 days. A consultation was recorded as complete from the date a note was placed in the EHR from a member of the PC treatment team. The range of days before PC was consulted occurred as soon as 2 days after admission and as far out as 40 days after the ICU admission. The reasons behind the variation in times were not assessed. Regardless, twenty-four hours into an ICU admission is an achievable benchmark to identify PC needs; but to initiate consultation, discussion amongst providers and staff need to occur in conjunction with a positive screening tool.

Screening tools should continue to be customized for facility use and factor in elements affecting the tools outcomes. The most appropriate diagnoses and utilization indicators relevant to the population using the tool should be taken into consideration. For example, the facility in this study does not treat a large hepatology population, resulting in the 'chronic liver disease' trigger being under represented. Additionally, the culture of the unit can influence if the triggers on the tool are marked when appropriate. Staff opinion may influence the discussion of need of PC services and produce variable charting from staff member to staff member. This cultural phenomenon may have contributed to the criteria on the screening tool titled "staff feel patient may benefit from palliative" being under triggered within the study results. Finally, those customizing the tools with diagnoses relevant to their facility, should also consider studying diagnoses and conditions not currently indicated for the tools.

Further discussion and investigation into diagnoses appropriate to include on PC screening tools are warranted. While the tool used in this study could predict the need for a PC consultation when more than one trigger was indicated, several diagnoses that have not been currently supported by research to illicit PCC resulted in the death of patients without PC services and without triggering any criteria on the tool. This outcome suggests the need for future inclusion of additional diagnoses on the screening tool for the facility under study. Respiratory failure secondary to sepsis/septic shock with pneumonia as the infectious process was the number one diagnosis resulting in the death of a patient without PC services. This diagnosis was often complicated by the patients also having comorbidities such as chronic kidney disease in various stages, hypertension (HTN), and cancerous malignancies. Complications from surgeries, planned or unplanned, including pulmonary embolism (P.E), gastrointestinal bleeding (GI bleed) and cerebral vascular accidents (CVA), also fell into this category. Lung and brain cancers with

suspected malignancies also resulted in patients' death after an ICU admission, but did not trigger any criteria on the tool. Currently, the diagnoses supported to be included on PC screening tools comprise mainly of end stages of disease processes and lacks researched consideration for acute complications or disease processes (Campbell et al., 2012; Nelson et al., 2013). Identifying acute disease processes and/or complications producing high mortality rates, such as sepsis, could further encourage earlier PC involvement.

Noncompliance is a billable diagnosis included in ICD-10 codes that has not be addressed by PC researchers. A patient failing to carry out the necessary self-care to maintain his/her illness should discuss their options for symptom management with a PC specialist. Despite the severity of illness, if the patient is not participating in his/her care, the progression of disease processes and options should be discussed. Providers admitting patients to ICUs have little time for such conversations as they attempt to treat the acute issues of declining patients. Thus, including noncompliance as an indicator for PC services during an ICU admission may decrease amounts of aggressive treatments and lengths of stay.

Anxiety, depression and pain are aggressively treated psychological conditions that result in physiological manifestations often impeding the healing of other disease processes (Baumbach, Gotz, Gunther, Weiss, and Meissner, 2018; Jeitziner, Hamers, Burgin, Hantikaninen, and Zwakhalen, 2015). Traditionally, intensive care providers are focused on treating more acute problems, making anxiety, depression and chronic pain secondary concerns for wholistic treatment. One of PC services primary functions is improving quality of care by managing symptoms (Jenko et al, 2015; Lapp and Iverson, 2015; Perrin and Kazanowski, 2015;). As a growing body of evidence endorses cautious use of sedatives and benzodiazepines within ICUs, utilizing PC for ICU patients with anxiety, depression and chronic pain should be

considered (Alexander, 2009; Marra, Hayhurst, Hughes, Marengoni, Bellelli, Pandharipande and Morandi, 2018; Pisani, Murphy, Araujo, Slattum, Van Ness, Inouye, and Inouye, 2009; Smith, Gangopadhyay, Goben, Jacobowski, Chestnut, Thompson and Pandharipande, 2017). The addition of these conditions on palliative care screening tools should trigger a consult, despite additional disease criteria, and could benefit both provider and patient by having additional support for treatment.

Additional support for treatment is needed in ICUs when treating those with severe chronic conditions. The severity of disease within an ICU often forces providers to have hurried end of life conversations. The possibility exists that many providers discuss end of life care goals with their patients and families, and change code statuses following these conversations, but still do not utilize PC services. This oversight may be due to a misunderstanding about PC, leaving providers feeling PC's presence unnecessary if the difficult conversation of establishing goals of care has already been addressed.

Providing support of PC cost savings in ICUs, when patients are screened to illicit PCC, provides strength for further implementation of the screening tool. A cost avoidance analysis is recommended in future studies utilizing PC screening tools in ICUs. This study did not analyze the potential cost savings of patients receiving PC after triggering the tool. However, applying the cost savings discovered in May et al. (2013) study may identifying the significance of initiating PC in ICUs earlier. May et al. (2103) found a savings of $1,312 when PC was initiated in ICUs after six days from admission and $2,280 if PC was initiated within two days of admission. Applying the study's savings within 2 days of admission to the 59 patients in this study that triggered the screening tool and did not receive PCC, identified missed cost savings of approximately $134,638.

Limitations

The retrospective design was a limitation that affected the assessment of the PC criteria. Triggered criteria may produce a falsely high consultation rate, skewing the perception of the most predictive criteria on the screening tool. For example, continuous renal replace therapy (CRRT) was found to produce a PCC 100% of the time it was triggered on the tool. However, the item was only triggered by one patient within the 110 patient charts reviewed. Additionally, all criteria may not present within the first twenty-four hours of admission, limiting representation on the tool. The twenty-four-hour time frame chosen for this study limited reviewing the outcomes of patients after treatment plans were initiated. Screening patients again at 48, 72 or 96 hours after admission may identify some patients no longer warranting PCC or, may find other patients who now trigger need for PC.

End of life discussions between providers, patients and families to establish goals of care, were not reviewed or taken into consideration. The code status of all patients at time of admission and/or time of death was not assessed and could have been used to further support decision making within the first 24 hours. Also, BHLex has a well-established Hospice program that some patients may have used instead of PC, following their ICU stay. Because the focus of this study is PC, hospice outcomes were not reviewed; however, including hospice outcomes could have strengthened the need for PC services sooner in patients' stay.

The electronic health record (EHR), Epic, created limitation to the study as well. Epic is used throughout the Baptist Health system but is not a required EHR for all healthcare facilities in Kentucky and Indiana. Because of the various EHRs in use, unless a previous admission to an outlying facility was indicated in admission notes, certain triggers on the tool may have been

under represented. Culture of the units under review and BHLex having no practice guideline in place at the time of analysis may have contributed to limited documentation of PC needs. Lastly, the availability of 110 charts as a sample size is small and additional records could change or strengthen the results.

Recommendations for Future Studies

Recommendations for future studies include further testing of screening tools specifically, tools need evaluation of triggers necessary to produce a PCC. While research already states each facilities ICU tool should be customized, having a standard set of criteria to choose from would streamline the process. Screening patients multiple times throughout their ICU stay is suggested, after 24 hours, again at 72 or 96 hours after admission may further filter or identify PC needs. Measuring time from admission to the PCC order being placed in the EHR should be applied to future studies. Further studies done prospectively within ICUs, implementing tested screening tools should be performed. Prospective studies could collect the perspectives of the providers and staff while validating a screening tool and should also consider screening patients at multiple points in their ICU admission. Additionally, it is recommended pairing the outcomes of the PC screening tool with open discussion with ICU providers and multidisciplinary teams during daily rounds.

Conclusion

The goal of this study was to determine if using a PC screening tool within the first twenty-four hours of an ICU admission could assess need for PCC. A correlation found that when more two or more points on the tool was triggered and a consultation was warranted, the consult occurred for 20/79 (25.3%) eligible patients. This finding further strengthened the body

of evidence that, while PC is needed in ICUs, the service is still grossly underutilized, even when indicated. Because no protocol currently exists in the units under review, the average time between admission and a PCC occurring was 5.5 days. Additional research is needed to strengthen the criteria in use and provide additional applications for the published screening tools.

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Table 1. *Demographic and clinical characteristics of the sample (n =110*)

	Mean (SD) or n (%)
Age	71.8 (8.3)
Gender Male Female	 n = 55 (50%) n = 55 (50%)
Race White Black	 n = 104 (94.5%) n =6 (5.5%)
Unit of Admission 2A 2B	 57 (51.8%) 53 (48.2%)
Received a consult	20/79 (25.3%)

Table 2. *Sensitivity and Specificity of Screening Tool*

	Received Consult	**Did *Not* Receive Consult**
Triggered Criteria on Tool	14 *(70% Sensitivity)*	21
Did *Not* Trigger Criteria on Tool	6	38 *(57.8% Specificity)*

Figure 1. *Master Palliative Screening Tool Criteria List*

Screening Tool Criteria	Authors
Admitted from skilled nursing facility- LTAC, LTC, home care or private duty nursing	(Zalenski et al., Hurst et al., Lapp Ilverson)
Advanced dementia - ALS, Parkinson's, Multiple Sclerosis	(Zaelenski et al., Hurst et al., Lapp & Iverson, Walker et al.)
Intracranial hemorrhage w/ anoxic encephalopathy or requiring ventilator support	(Zalenski et al., Creutzfeldt et al., Hurst, Lapp & Iverson, Hua et al. , Walker et al.)
Advanced stage 4 metastatic cancer	(Zalenski et al., Browning et al., Hurst et al., Creutzfeldt et al., Sihra et al., Lapp & Iverson, Jones & Bernstein, Hua et al., Walker et al)
Status post cardiac or respiratory arrest	(Zalenski et al., Browning, et al. Hurst et al., Creutzfeldt et al., Lapp & Iverson, Hua et al., Walker et al.)
ICU admission after > 5 days of hospital stay	(Zalenski et al., Hurst et al.)
ICU readmission with same diagnosis within 30 days	(Zalenski et al., Hurst et al.)
Treatment team perceived PC needs	(Zalenski et al.)
> 1 month hospital stay	(Browning et al.)
Family Request	(Browning et al.)
Multisystem organ failure	(Browning et al., Lapp & Iverson, Walker et. Al)
Poor neurological prognosis	(Browning et al.)
Nonstransplantable liver failure	(Browning et al.)
Disagreement with goals of care between family and providers or family members	(Browning et al., Lapp & Iverson)
> 70 years old with 2 or more comorbidities	(Sihra et al.)
> 80 years old with 2 or more comorbidities	(Creutzfeldt et al., Hua et al.)
Mechanical ventilation > 7 days	(Sihra et al.)
Does the patient have distressing physical &/or psychological symptoms?	(Jenko et al.)
Are there specific social/support needs for patient &/or family?	(Jenko et al.)
Have goals of care been identified & are treatment options matched with patient-centered goals?	(Jenko et al.)
Major acute neurologic insult - CNS trauma, post-CPR encephalopathy, malignant stroke	(Lapp & Iverson)
Chronic Liver Disease	(Lapp & Iverson)

Figure 2. *Master Palliative Screening Tool Criteria List Continued*

Screening Tool Criteria continued	Authors
Chronic renal disease	(Lapp & Iverson)
Advanced Chronic Obstructive pulmonary disease	(Lapp & Iverson)
Severe congestive heart failure (class III or class IV)	(Lapp & Iverson)
> 1 admission for the same condition within 3 months	(Lapp & Iverson)
> 1 ICU admission during the same hospital stay	(Lapp & Iverson)
Consideration of PEG tube placement	(Lapp & Iverson)
Consideration for tracheostomy placement	(Lapp & Iverson)
Ethics consultation	(Lapp & Iverson)
Consideration to start continuous renal replacement therapy during ICU stay	(Lapp & Iverson)
Lack of social support	(Lapp & Iverson)
" No" answer to "surprise question"	(Lapp & Iverson)
Anticipated discharge to long-term acute-care facility	(Lapp & Iverson)
Homebound due to chronic illness	(Lapp & Iverson)
Intensive Care Unit Stay > 2 weeks	(Jones & Bernstein)
> 75 years old with multisystem organ failure	(Jones & Bernstein)
Stroke Scale > 4	(Jones & Bernstein)
> 2 ICU admissions during same hospital stay	(Walker et al.)
Consideration of mechanical ventilator withdraw expected to result in death	(Walker et al.)
ICU admission following hospital stay > 10 days	(Creutzfeldt et al., Hua et al., Walker et al.)
Exceeding expected length of stay by more than 50%	(Sihra et al.)

Figure 3. *ICU Admissions Palliative Screening Tool*

Admission Date:_____ Unit of Admission: 2A 2B (Circle one)

Diagnoses (if not indicated on tool)_____ Age of Patient:_____

Diagnoses at Time of Admission to ICU
CHECK ALL THAT APPLY

__ > 80 years old and has >/= 2 comorbidities

__ Intracranial hemorrhage with mechanical ventilation

__ s/p cardiac and/or respiratory arrest

__ Terminal dementia or severe cognitive impairment (defined as: bed-bound, incontinent, unable to speak, fed by tube feeding via PEG or feeding tube

__ Mechanical Ventilation > 7 days

__ Multi Organ System Failure > 2 organs

__ Need for continuous renal replacement therapy CRRT

__ Staff (nurses, social worker, provider) feel patient may benefit from palliative care

__ ICU admission following hospital stay > or = 10 days

__ Chronic Liver Disease

__ Chronic Obstructive Pulmonary Disease

__ Congestive Heart Failure NYHA Class 3 or 4

__ >1 admission for the same condition/disease process within the last 3 months

__ Admission from long term nursing care facility

__ Consideration for PEG tube placement and/or tracheostomy

Palliative Care Consult during this admission_____ Death during this admission: Yes No

Date of Consult if applicable _____ Death since discharge: Yes No

Figure 4. *Receiver operating characteristic (ROC) curve of screening triggers*

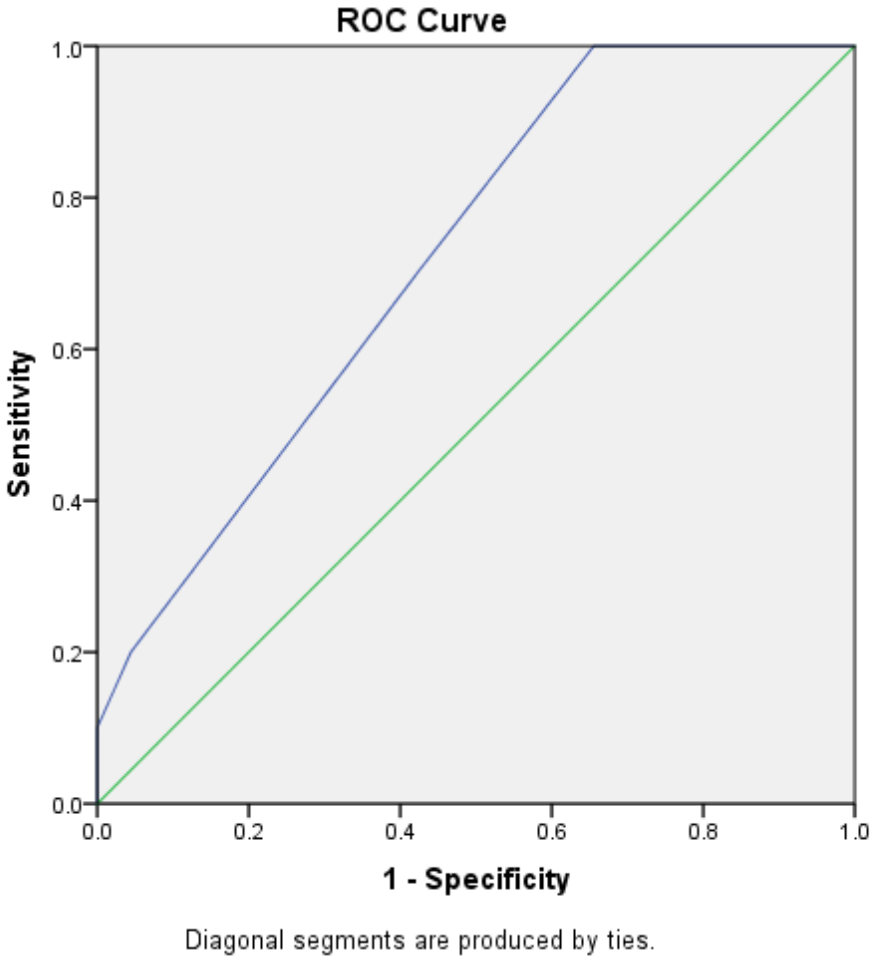

Figure 5. *Studies Reviewed For Screening Tool Development*

Studies Reviewed for Screening Tool Development
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