A Strategy to Decrease Post-Intensive Care Syndrome: The Use of ICU Diaries in the Pediatric Intensive Care Unit

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Abstract

Purpose: The purpose of this quality improvement project was to educate Pediatric Intensive Care Unit (PICU) staff about Post-intensive care syndrome (PICS) and implement an ICU diary program for pediatric patients and their families.

Background: PICS is a newly recognized condition which occurs in patients following an intensive care stay. This condition exhibits a wide spectrum of physical, psychological, and cognitive symptoms. ICU diaries have shown promise in lessening the effects of PICS when used throughout a patient’s hospital stay.

Sample/Setting: 58 registered nurses working in a 12-bed midwestern PICU and 9 patients and their families participated in this pilot project.

Methods: A coordinated education and ICU diary program was implemented and evaluated with descriptive statistics. All PICU RNs received PICS education. ICU diaries were implemented with patients and families with a length of stay greater than 3 days. Surveys were completed by PICU RNs and patients/families. These surveys determined the benefits, clinical utility, and pragmatics of the ICU diaries.

Results: Over two-thirds of nurses felt that the ICU diary program was beneficial to their patients and families and identified the time burden was minimal. Families were receptive and open to the use of the diary to document their child’s ICU stay.

Conclusion: Overall, the coordinated use of PICS-related education and the ICU diary lead to increased knowledge about PICS and improved communication between the bedside nursing providers and families in the PICU.

Key words: post-intensive care syndrome (PICS), pediatrics, critical illness, mental health, caregivers,
A Strategy to Decrease Post-Intensive Care Syndrome: The Use of ICU Diaries in the Pediatric Intensive Care Unit

Post-intensive care syndrome or PICS is a recognized condition that is defined as a new or worsening impairment in psychological, cognitive, or physical health status after critical illness which extends beyond the patient’s hospitalization (Needham et al., 2012). It was first acknowledged during a meeting of critical care stakeholders in 2010 and has been formally identified in patients after intensive care unit (ICU) hospitalizations (Needham et al., 2012). The condition has been studied in adult populations for several years and it is estimated that at least one third of adult ICU patients have experienced at least one symptom of PICS (Davidson, Harvey, Schuller, & Black, 2013). PICS is not isolated to the patient; it can also affect the parents and family causing psychological and emotional trauma, which is known as Post-Intensive Care Syndrome-Family (PICS-F) (Davidson et al., 2013; Locke et al., 2016). In recent years, PICS has been identified and studied in pediatric patients and families as well. Unfortunately, there are few standardized approaches to address PICS and PICS-F in the pediatric ICU (PICU) setting (Esses, Small, Rodemann, & Hartman, 2019).

**Background**

Post-intensive care syndrome is rooted in the changing outcomes and increased level of care offered to critically ill patients. Enhanced education about critical illness, training, medical knowledge and technology have led to an increased number of children admitted to PICUs and surviving severe illness or injury (Namachivayam et al., 2010). In 2006, an analysis of the United States’ Kids Inpatient Database (KID), revealed approximately 45,500 hospitalizations that required children to utilize critical care services (Healthcare Cost and Utilization Project, 2006). Of this particular population, 40% had a comorbid illness (Healthcare Cost and
Utilization Project, 2006). The Virtual Pediatric Intensive Care Unit Performance System (VPS) is an additional source of information about PICU admissions. In 2008, there were almost 53,000 admissions to 54 PICUs in the United States (as cited in Edwards et al., 2012). Of these children, 53% had a complex chronic condition (as cited in Edwards et al., 2012). It is clear that there are a large number of pediatric patients admitted to the ICU each year and many have chronic medical conditions. These hospital experiences result in more children living with chronic diseases or conditions which can limit their physical, emotional, or psychological health following an ICU admission. These limitations further the risk for developing PICS. In order to better understand PICS, it is beneficial to have a grasp of the range of symptoms that occur in these patients during and after their ICU stay.

Children experiencing PICS have a wide spectrum of symptoms. Physical and functional impairments occur due to loss of muscle mass, impaired lung function, fatigue, and weight loss (Ekim, 2018). Cognitive impairments can occur as well due to brain dysfunction or hypoxia which can significantly affect a child’s IQ and ability to perform tasks at school following an ICU stay (Ekim, 2018). Psychological changes are often the most prevalent; encompassing a wide range of symptoms that can mimic or be diagnosed as post-traumatic stress disorder (PTSD) (Ekim, 2018). Prevalence of PTSD diagnosis can be as high as 17-29% in school-aged children and adolescents following a PICU admission (Dow, Kenardy, Le Brocque, & Long, 2013). The percentage of children exhibiting PTSD symptoms, without having the specific diagnosis, is closer to 84% (Nelson & Gold, 2012). In one adult study, 35% of patients with prolonged mechanical ventilation had PTSD diagnoses following their hospitalization (Bienvenu et al., 2013). It is clear that post-intensive care syndrome is a distinct constellation of symptoms that can affect children following a critical illness.
Mortality

Because the concept of PICS is still relatively new, there are no mortality statistics which are specifically related to this syndrome. However, it is important to note the general mortality of children admitted to PICUs. In 2006, a sample of 45,521 critical care hospitalizations, PICUs reported a 6% mortality rate or approximately 2,731 pediatric deaths (Healthcare Cost and Utilization Project, 2006). In another sample of 52,791 critical care hospitalizations, PICU mortality was 2.7% or 1,425 pediatric deaths (as cited in Edwards et al., 2012). Mortality rates in both samples was higher for children with chronic medical comorbid conditions (Odetola et al., 2010, Edwards et al., 2012).

Morbidity and Disability

Post-intensive care syndrome and morbidity outcomes are closely linked. In a large study completed in Australia, a cohort of 712 pediatric patients was followed throughout their ICU stay (Namachivayam et al., 2010). Approximately 18% of these patients had a moderate or severe long-term disability following their hospitalization (Namachivayam et al., 2010). These disabilities were defined using the modified Glasgow Outcome Score. Children who were categorized as having moderate or severe disabilities were dependent upon partial or complete nursing care (Namachivayam et al., 2010). Additionally, in a group of PICU patients admitted with sepsis and meningoencephalitis, cognitive function was tested following their hospitalizations and compared with healthy children. The children with PICU hospitalizations underperformed in areas that required executive function, attention, and memory (Als et al., 2013). Whether a critically ill child is diagnosed with a physical or cognitive impairment following PICU hospitalization, both diagnoses may fall under the umbrella of PICS (Herrup, Wieczorek, & Kudchadkar, 2017).
Quality of life is also affected following a PICU hospitalization. In a group of 97 PICU patients, quality of life inventories were completed at three months and one year post hospital discharge and compared with norms of healthy children (Colville & Pierce, 2013). These inventories included questions about physical, emotional, social, and school functioning (Colville & Pierce, 2013). Compared to the healthy norms, the PICU group had lower overall quality of life (QOL) scores at three months post-discharge, especially in the physical and school functioning subgroupings; however, at one year the scores were similar (Colville & Pierce, 2013). In another study across eight pediatric ICUs, patients’ functional statuses were examined following PICU discharge. Functional status scores (FSS) assessed the mental, motor, respiratory, and sensory function, as well as communication and feeding ability of the child (Pollack et al., 2014). A new significant morbidity was defined as a worsening of FSS by 3 points or greater from pre-hospitalization baseline (Pollack et al., 2014). A new significant morbidity occurred in 4.8% of the patients in the study (Pollack et al., 2014). In addition, there was data to support worsening of functional statuses for patients with baseline decreased functional statuses (Pollack et al., 2014).

**Economic Burden**

An admission to the PICU itself is a source of financial burden for families; posing increased nonmedical out-of-pocket expenses, impacting family budgets and savings plans, and even disrupting work schedule for parents (Clark, Cummings, Kuhlthau, Frassica, & Noviski, 2017). Additional healthcare costs may be incurred for further medical evaluation or treatments related to the direct symptoms of PICS especially for those children with cognitive impairments. Cognitive impairments within PICS following PICU stays can result in problems with attention, memory, and even slower mental processing (Hopkins & Girard, 2012). These deficits may
require long-term follow-up which contributes to both direct and indirect costs for the parent or
caregiver (Hopkins & Girard, 2012). Psychological symptoms such as depression, anxiety, or
PTSD can also lead to increased healthcare costs and loss of expectations for the child’s
anticipated future (Hopkins & Girard, 2012). A unique difference between PICS in pediatrics
and adults is that children often will survive more years with a specific morbidity following
illness (Herrup et al., 2017). Further, the child’s continually developing brain poses specific
considerations when compared to adults with PICS (Herrup et al., 2017). It is apparent that the
symptoms of PICS can cause both financial and familial burdens on pediatric ICU patients, both
during their stay and after discharge.

**Significance**

The significance and prevalence of PICS has led the healthcare community to identify
specific clinical guidelines to increase awareness and decrease the incidence of PICS in both
adult and pediatric patients. The “ABCDEF” bundle was created by the Society of Critical Care
Medicine (SCCM) following extensive literature reviews and has been implemented in different
ICU settings throughout the country (Ely, 2017). The “ABCDEF” bundle consists of elements of
care designed to Assess and treat pain, perform awake Breathing trials, Choose sedation and
analgesia wisely, assess for Delirium, Early mobility and exercise, and Family engagement and
empowerment (Ely, 2017). It is meant to be individualized and adapted to the patient’s
progression through their ICU hospitalization (Ely, 2017). The use of the bundle has had positive
results in ICU delirium rates, days of mechanical ventilation, and length of stay (Ely, 2017). The
SCCM has also created education about PICS for healthcare providers and patients and families,
while also advocating for the creation of support groups for ICU patients and families through a
program called THRIVE (Davidson, Hopkins, Louis, & Iwashyna, 2013). THRIVE is an
initiative sponsored by the SCCM which aims to provide resources, education, and support to patients and families who have been hospitalized in the ICU setting (Society of Critical Care Medicine, n.d.).

The psychological effects of PICS have created a need for mental health services. The National Association of Pediatric Nurse Practitioners (NAPNAP) has made several position statements about the access to care for pediatric patients. One of their goals for 2019 was to improve the access to comprehensive medical services for all children with a special emphasis on behavioral and mental health services (Health Policy Agenda, 2019). The American Academy of Pediatrics (AAP) also advocates for early identification of mental health disorders in children (American Academy of Pediatrics, 2015). This advocacy includes routine screening and prompt interventions for children at risk (American Academy of Pediatrics, 2015). In addition, there is an increased need for access to health services for children. There is often a significant disparity in subspecialty services for children, causing complete lack of access to care or requirement to travel long distances to receive appropriate care (Improving Access to Care, 2019). Children with PICS may require further outpatient treatment from mental health specialists or subspecialty providers after discharge from the hospital.

The literature suggest that PICS affects up to one-third of PICU survivors (Herrup et al., 2017). Anecdotal evidence gathered from social workers and child life specialists in a Midwestern children’s hospital suggest that symptoms of PICS is evident in the PICU and medical/surgical units. These symptoms capture the physical, cognitive, and psychological aspects of PICS. Personally, this author has noted many patients and families who experience fatigue, anxiety, fear, decreased attention, lack of sleep, and loss of muscle function during and
after critical illness. Further, the institution does not receive any formal education about PICS nor implement specific interventions to decrease its incidence.

**Clinical Problem**

Post-intensive care syndrome is responsible for a spectrum of impairments following an intensive care hospitalization. Post discharge, pediatric patients are affected by unrecognized or exacerbated physical, cognitive, and psychological deficits resulting from their hospital experiences. The SCCM and AAP are advocating for changes to acknowledge and decrease the sequelae associated with PICS; however, few institutions have adopted initiatives to combat this newly recognized phenomenon.

The purpose of this quality improvement project was to educate PICU staff about PICS and implement strategies to decrease its impact on pediatric patients in a Midwestern 12 bed PICU.

The aims of this project included:

1. Develop and implement an educational PowerPoint for PICU staff about signs and symptoms of PICS in pediatric patients and families.
2. Create ICU diaries for patients and families to be used during their PICU stay.
3. Evaluate the implementation of the ICU diaries on the PICU staff’s workload and the families’ utilization and acceptance of the ICU diaries via surveys.

**Available Knowledge**

A literature search was conducted utilizing resources from PubMed, National Center for Biotechnology Information (NCBI) and Google Scholar. Key words for the literature review included: “post-intensive care syndrome”, “pediatrics”, “quality of life”, “PICS”, “PICU”, “mental health”, “PTSD”, “educational interventions”, and “ICU diaries”. There were minimal
references related to ICU diary implementation to decrease PICS in pediatric intensive care patients. The adult literature provided several studies that implemented ICU diaries; however, they did not address specific information about the benefits and effectiveness when used with the patient’s families. The adult literature was considered if it related to implementing diaries in the ICU setting. The topics of PICS related educational interventions for nurses were explored as well. Inclusion criteria included focus on the topics of educational interventions for nurses and ICU diaries related to PICS. A total of eight studies met these criteria. The Johns Hopkins Nursing Evidence Based Practice tool was utilized to ascertain the level and quality of the evidence for these eight studies. All eight research studies met criteria for level III (non-experimental) evidence.

**Nursing Educational Interventions**

Nurses are actively involved in all aspects of the care of PICU patients; therefore, it is important to understand that educational materials or programs should be tailored to their needs. A qualitative pilot study was completed in an academic PICU in the Midwest to introduce the concept of PICS and provide education to both nursing staff and families in the PICU (Esses et al., 2019). Nursing staff that participated in the project were given informational worksheets that included symptoms of PICS [weakness, fatigue, depression, anxiety] to be watchful of in their patients and families (Esses et al., 2019). Nurses were encouraged to watch for these symptoms in both their patients and families (Esses et al., 2019). The worksheet also included information about feelings of being overwhelmed, isolated, or changes in sleep that can also occur in families of children in the ICU (Esses et al., 2019). PICS education was in the form of an informational worksheet only and was limited to the nursing staff who were caring for the participants in the study. No other formal education was received by the nursing staff (Esses et al., 2019). Surveys
were given to nurses after the education was completed with Likert style responses such as “never heard of” or “very familiar” (Esses et al., 2019). Results of the 19 nurses surveyed revealed overwhelming positive answers to questions that were related to the usefulness of the PICS educational program. It also suggested that the organizational culture was receptive to promoting the well-being of families (Esses et al., 2019). A large majority, 84% of the nurses also agreed that the use of the educational worksheet fit well with their workflow and learning style (Esses et al., 2019).

Herrup, Wieczorek, and Kudchadkar (2019) conducted an observational pilot study that implemented 19 patient diaries over the course of the patient’s PICU stay. This study included PICS education for the nursing staff; however, the effectiveness of the teaching methods was not specifically evaluated. The education was in the form of informational sessions, online educational modules, fact sheets, and in-person bedside review of information related to PICS (Herrup et al., 2019). Additionally, nursing staff was given sample entries to ease the occasional difficulty in knowing what to write for the first entry (Herrup et al., 2019). This education was instrumental to the project and allowed nurses to have a rationale for using the diaries with their patients.

Prior to implementing a practice change, it is important to encourage nurse buy-in. Nurses play a large part in any practice change initiative; therefore, it is imperative trust, balance of options, personal connection, and time are considered, all of which increase nursing buy-in (French-Bravo & Crow, 2015). Often times, buy-in is the difference between an engaged nurse, one that is disengaged, or is just going through the motions (French-Bravo & Crow, 2015). A qualitative study including 23 Japanese in-patient nurse managers and 17 nurses was completed to determine successful attributes to change (Kodama & Fukahori, 2017). Nurse managers were
interviewed about their experiences when implementing change on their units and staff nurses were asked questions regarding their feelings related to making the change (Kodama & Fukahori, 2017). Four major themes were identified after interviewing both nurse managers and nurses (Kodama & Fukahori, 2017). In order to have positive change on a unit, a.) the imitators of the change needed to be aware of system perspectives, b.) the nurses should respect the beliefs and standards, c.) leadership should be proactive and d.) have empathy (Kodama & Fukahor, 2017). If these elements are considered and in place, change on a unit can happen more successfully.

**ICU Diaries**

A qualitative evidence-based pilot study was completed in which researchers implemented ICU diaries in the adult ICU over a period of 10 months (Blair, Eccleston, Binder, & McCarthy, 2017). The sample included 50 patients. The inclusion criteria required the patients to be either mechanically ventilated for greater than 24 hours or have positive delirium scores (Blair et al., 2017). All members of the multidisciplinary team as well as the family were encouraged to make entries into the diary (Blair et al., 2017). Feedback about the use of the diary was completed throughout the 10-month period via surveys and dialogue with the study participants (Blair et al., 2017). Common themes for using the diary included: a.) to keep track of patient events, b.) a means of communication, and c.) relaying messages of hope were identified by participating family members and patients (Blair et al., 2017). There were some initial struggles with staff buy-in due to the feeling of being over-burdened by adding another task to the provider’s already busy shift; however, feedback was relatively positive after using the diary (Blair et al., 2017). Providers remarked that the diaries brought a unique meaning to the care they provided and allowed the patient a way to remember their ICU stay (Blair et al., 2017). Overall, this pilot study highlighted the unique ways that ICU diaries can benefit patients and especially
families during their ICU stay. Maintaining diaries may also have positive implications for patients reconciling their hospital experience following discharge.

Another pilot study examining the use of an ICU diary was initiated in a military medical setting for critically ill adult patients. The participants were patients who were mechanically ventilated for greater than 24 hours or scored positive on delirium assessment tools (Locke et al., 2016). The diaries were contained in clear plastic binders and included an “About Me” page that families completed so those making entries had a personal reference for the patient (Locke et al., 2016). The researchers included educational information that was disseminated to medical providers and families about PICS so that everyone could have a better understanding of the intervention (Locke et al., 2016). The diaries were meant to follow the patient throughout their hospital stay and could be taken home upon discharge (Locke et al., 2016). Over a 5-month period, 20 diaries were implemented. Staff were surveyed about barriers, benefits, and improvements for implementing the diary to patients (Locke et al., 2016). Many nurses felt that they did not know what to write but were able to participate after a diary was already started (Locke et al., 2016). Additionally, the nursing staff did not perceive that the diary entries took too much time or were a burden to them (Locke et al., 2016). Families viewed the diaries as a source of hope and used them as a way to cope with their situation and the ICU stay (Locke et al., 2016). The diaries were once again, a positive addition to the ICU experience for not only patients and families but for the staff as well.

A qualitative pilot study was initiated by researchers to assess and implement the use of an electronic version of an ICU diary. Four patients and their families participated in this study (Scruth, Oveisi, & Liu, 2017). The researchers recognized that diaries have been shown to decrease psychological impacts caused by critical illness and gives patients and families a way to
fill the gaps in their ICU stay (Scruth et al., 2017). The families that received the electronic version offered positive feedback in its ease of use and were impressed that it gave them a place to offer open communication between the medical providers and family members (Scruth et al., 2017). There were some staff concerns about the legal implications of writing in the diary or the privacy settings on an electronic device; but overall, they were pleased with the device and its ease of use (Scruth et al., 2017). This study was one of the only studies available that assessed the use of an electronic ICU diary option.

Another qualitative study was completed by researchers in France to evaluate the use of diaries in the adult ICU. Diaries had been standard practice on this unit since 2009 and many members of the medical team frequently add entries (Garrouste-Orgeas et al., 2014). To assess the families’ experiences with the diaries, the research team completed interviews with the families over a period of several months (Garrouste-Orgeas et al., 2014). Three common themes were identified in the interviews with families: a.) the diaries allowed the family to have increased access to medical information, b.) the diaries improved comprehension of that information, and c.) the diaries were a way to communicate with other family members (Garrouste-Orgeas et al., 2014). Additionally, family members noted that the diaries allowed them to document their presence to their loved one while maintaining hope throughout the ICU stay (Garrouste-Orgeas et al., 2014). Lastly, the diaries allowed the ICU experience to be humanized and provided a great way to have a “big picture” of the patient’s stay (Garrouste-Orgeas et al., 2014). ICU diaries in this adult ICU allowed both staff and families to complete a comprehensive overview of the patient’s stay which was therapeutic for all involved.

Following their specific PICS nursing education, Herrup et al., (2019) implemented and evaluated the use of ICU diaries in their qualitative improvement study. This pilot project
suggested favorable outcomes in 19 patients who used the diaries over the course of 441 PICU days (Herrup et al., 2019). The diary was implemented with the goal of it being a personal story for the patient and family to contribute to throughout their PICU stay (Herrup et al., 2019). Binders were given to families, but all members of the healthcare team were encouraged to contribute entries. Some families consented to having photographs taken and added to the diary (Herrup et al., 2019). Nursing staff were given sample entries to ease the occasional difficulty in knowing what to write for the first entry (Herrup et al., 2019). Two weeks after PICU discharge, families were asked to complete a survey about their experiences; 60% of the families responded and all felt the diary was beneficial (Herrup et al., 2019). Parents remarked that they enjoyed writing and seeing entries in the diary and it gave them an outlet to eventually share with their child (Herrup et al., 2019). The one negative of the project was that there were often days without entries due to low staff engagement (Herrup et al, 2019). However, overall, the diaries were a positive change to the unit and appeared to benefit patients, families, and staff members.

An additional qualitative pediatric ICU diary study was completed in Denmark. The PICU unit structure was a six bed, multidisciplinary unit where ICU diaries had been implemented for a decade (Mikkelsen, 2018). Personal diaries were implemented for all children in the PICU who were hospitalized greater than 3 days (Mikkelsen, 2018). The diaries included daily entries from the nursing staff, pictures, and standardized descriptions of procedures and events (Mikkelsen, 2018). Members of the healthcare team wanted to analyze the use of the diaries from the parent perspective (Mikkelsen, 2018). The pilot study was completed over a 6-month period of time. Families were approached to complete interviews with researchers about their experiences with the diaries (Mikkelsen, 2018). Five children and their parents, all who had received care in the PICU agreed to face-to-face interviews following discharge (Mikkelsen,
The children were able to verbalize that the diaries were helpful for them to make sense of their ICU stay (Mikkelsen, 2018). Parents found the diaries helpful because they perceived that they added value to their family and allowed them to provide structure to their ICU stay, all while being written in common language (Mikkelsen, 2018). The downside to this study is the convenience sampling of the study group. In addition, both pediatric studies had relatively small sample sizes with moderate levels of response from surveys or interviews to the intervention.

**Summary of Literature**

Although the literature search did not reveal robust results related specifically to ICU diaries and the prevention of PICS; there was evidence suggesting that ICU diaries promoted positive hospital experiences and may help lessen the development of PICS. Both paper and electronic forms of the ICU diary showed promise with providing an avenue for patients and families to cope with their ICU experience (Blair et al., 2017; Garrouste-Orgeas et al., 2014; Herrup et al., 2019; Locke et al., 2016; Mikkelsen, 2018; Scruth et al., 2016). The literature supported a paper version and encouraged entries by all members of the healthcare team (Garrouste-Orgeas et al., 2014; Herrup et al., 2019; Locke et al., 2016, Mikkelsen, 2018). Guidance from the literature suggested that entries should be written in common language, avoiding medical jargon (Blair et al., 2017; Garrouste-Orgeas et al., 2014; Herrup et al., 2019; Locke et al., 2016; Mikkelsen, 2018; Scruth et al., 2016). Additionally, providing examples of diary entries may ease the comfort of healthcare providers reluctance to contribute to the diary (Herrup et al., 2019). Family entries may include personal information about the patient to enhance the provider/patient relationship. The inclusion of family pictures in the diary was well-received and should be a consideration (Herrup et al., 2019). Though electronic versions of the diaries are an interesting alternative, cost and confidentiality should be considered (Scruth et
The diaries were implemented in pediatric patients with a length of stay greater than 3 days (Herrup et al., 2019; Mikkelsen, 2018). The diaries should be used throughout the ICU stay and given to families upon discharge (Blair et al., 2017; Garrouste-Orgeas et al., 2014; Herrup et al., 2019; Locke et al., 2016; Mikkelsen, 2018; Scruth et al., 2016). Education regarding PICS was well received by healthcare providers. Effective teaching methods included PowerPoint presentations, real-time bedside education, and informational worksheets (Esses et al., 2019; Herrup et al., 2019). Promoting nurse buy-in and unit change should include these foundational themes of a system perspective, recognizing values and beliefs, proactivity, and empathy (Kodama & Fukahori, 2017).

**Theoretical Framework**

The theoretical framework that was applied to this PICS education and ICU diary program was the Evidence-Based Practice Model developed by Rosswurm and Larrabee in 1999. This model uses six steps to guide researchers in quality improvement projects by assessing the need for change, linking the intervention to an outcome, synthesizing best evidence, designing a practice change, implementing a pilot, evaluating the pilot, and finally, integrating the practice change (Rosswurm & Larrabee, 1999). The project progression through Rosswurm and Larrabee’s six step model of evidence-based practice change is illustrated in Table 1.

Table 1

*Evidence-based Practice Change Steps*

| Step 1: Assess need for change in practice | • Collected internal anecdotal data from the multidisciplinary team about prevalence of PICS type symptoms in PICU patient population, explored literature related to PICS  
• Informally surveyed bedside RN staff about use of referral to child life/social |

...
• Work to get a better understanding of addressing emotional needs/support of patients and families
  - Identified the clinical problem and opportunity for improvement

**Step 2: Link problem interventions & outcomes**

• Formulated the purpose and aims for implementing the PICU diaries
  - Conducted a deliberate, rigorous literature review addressing the clinical problem
  - Identified key search terms and created inclusion, exclusion criteria

**Step 3: Synthesize best evidence**

• Synthesized best evidence
  - Considered feasibility, benefits, and risks of implementing an ICU diary in the pediatric population

**Step 4: Design Practice change**

• Created a nursing education module
  - Submitted request for approval from the unit education coordinator.
  - Created process for loading education documents on hospital learning management system (LMS). Nursing staff received an email once the presentation was available and 1-2 reminder emails to complete education.
  - Identified expenses related to purchase of binders and its contents: clear binder, paper, paper divider tabs
  - Obtained nursing-buy from members of unit council
  - Obtained input from nursing staff about best location and timing to complete entries
  - Presented practice change to PICU RNs, providers, and staff
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<tr>
<th>Step 5: Implement &amp; evaluate practice change</th>
<th>Step 6: Integrate &amp; maintain practice change</th>
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<tr>
<td>• Created evaluative survey to assess the clinical utility of ICU diaries</td>
<td>• Identified common themes about the clinical utility of the diary</td>
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<td>• Identified patients and families who would benefit from ICU diary intervention (at least 1 parent English speaking, LOS &gt; 3 days). Approached family and asked for permission to participate in project. Bedside nursing spoke with unit manager to determine inclusion of potential participants. 3-4-month time frame for participation</td>
<td>• Provided summary of findings to unit leadership</td>
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<td>• Surveyed families throughout the implementation process.</td>
<td>• Identified modifications to proposed practice change</td>
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<tr>
<td>• Surveyed nursing staff on impact of project, how often they used the diary, time burden, process/system type outcomes</td>
<td>• Disseminated findings at the National Association of Pediatric Nurse Practitioners (NAPNAP) National Conference via poster presentation</td>
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<tr>
<td>• Collected and analyzed data from October 2019 to January 2020</td>
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The methodology of the project that provided the overarching principles was adapted from the Post Intensive Care Syndrome – Pediatrics framework (Manning, Pinto, Rennick, Colville, & Curley, 2018). This framework identifies the child in the center, with the family including parents and siblings closely linked to the child’s experience (Manning et al., 2018).
The ICU experience is affected by the child’s baseline status (Manning et al., 2018). The child and family’s physical, cognitive, emotional, and social health is greatly impacted by the child’s ICU course and progression of illness (Manning et al., 2018). The trajectory of recovery of the child is closely related to the illness and alterations in these four health dimensions (Manning et al., 2018). This framework reinforced that the child is at the center of the care, however, the family is closely linked and crucial to the child’s hospital experience and recovery.

**Methods**

The project was reviewed by the Institutional Review Board (IRB) at the University of Minnesota Medical Center by the Human Subjects Committee. The project was granted exempt status and categorized as a quality improvement project, see Appendix A; University of Minnesota Medical Center IRB. The project was also approved by the author’s academic institution, Creighton University; see Appendix B: Creighton University IRB. The project was also supported by PICU leadership at the facility; see Appendix C: Unit Support.

Participation in the project was expected for all nurses on the unit, however, participation was not mandatory. Family participation was voluntary. There were no incentives for completion of education or surveys. The contact information of the researcher was included in emails and unit communication to allow participants to ask questions prior to participation. Individual patient diaries were kept in the patient’s room and not removed until after patient transfer or discharge and sent with the family. All providers who wrote in the diaries were instructed on proper information to be included in the diary entries. All data that was collected was stored on a password protected hospital computer share drive. All personal health identifiers were removed. Parents were advised that all members of the healthcare team had access to the diary and warned them of including any sensitive information that they would not like to be shared. To address
potential legal or risk concerns, only the writer’s names were included in the entries. All entries were signed, dated, and written in black ink or typed.

**Project Design**

This quality improvement project used an observational pilot study design that was evaluated with descriptive statistics.

**Sample**

Eligible participants (N=58) for the educational model included full-time and part-time direct patient care Registered Nurses (RN) in the PICU. There is a mix of day shift, night shift, and rotating day/night shift staff. Nurses in the critical care float pool were also asked to participate because they occasionally provided care for PICU patients on the unit. The target population for this project included all families and children admitted to the PICU. Inclusion criteria for the diary component included an anticipated length of stay greater than 3 days and at least one parent who was English-speaking. A total of 9 patients and their families participated in the project. The youngest patient who was involved was two months of age, while the oldest was 6 years of age. The average age of the patients was 29 months of age. Patients had a variety of primary diagnoses; ranging from an inherited metabolic disorder, neurological conditions, respiratory failure, and malignant neoplasms. The average PICU length of stay (LOS) was 18.9 days. Eight patients were transferred to the general care floor and one patient died. Two patients returned to the PICU during the study period and journals were resumed if parents requested.

**Setting**

The setting for this project was the pediatric intensive care unit (PICU) at a 12-bed midwestern teaching hospital. The unit has 12 critical care beds with 24/7 coverage by intensivists, nurses, and respiratory therapists. There is a dedicated unit social worker and child
Life specialist that are present Monday-Friday. The nursing to patient staffing ratio is 1:1 or 1:2 with some patients requiring 2:1 nursing care due to critical interventions. The patient population of this PICU includes patients with respiratory, neurological, and renal diagnosis as well as post-operative patients. The hospital has a case load that also includes solid organ transplants and bone marrow transplants.

**Intervention**

**Nurse Education.** Prior to implementation of the diaries, the PICU nursing staff received education regarding the PICS phenomenon and its impact on patients and families. The educational component of the project was focused on increasing knowledge of PICS. A PowerPoint presentation was created with content about what constitutes PICS, signs and symptoms in children and families, and identification of resources that can be utilized while the family was in the ICU environment. The presentation was uploaded onto the hospital learning management system (LMS). All PICU nurses were assigned the module, which was added to each nurse’s education queue. Communication about the educational PowerPoint was provided to the nursing staff via a blanket email on the PICU listserve. Posters on the unit served as encouragement to complete the PICS online education. Nursing staff had one month prior to diary implementation to view the educational presentation. The goal was that increased knowledge about PICS prior to utilizing the diaries would give the nursing staff a better understanding of why this project was being done on the unit.

**Diary Implementation.** The ICU diary was simple and composed of a clear three-ring binder with blank pages inside where the medical team wrote updates about the patient’s condition. The focus of the diary entries was on the patient’s condition in plain language, avoiding medical jargon. The diaries had an “about me” section at the beginning of the diary
where families provided some personal information about the patient (see Appendix D: About Me). Diaries were kept in the patient’s room in a designated location and a sticker was utilized on the patient’s name tag or door to indicate participation in the project. PICU staff and family members were given informational sheets about the ICU diary project to answer questions and provide guidance on diary entries (see Appendix E: ICU Diary Information Sheet). Diaries were started by the bedside nurse caring for the patient with a quick summary of what brought the patient to the ICU. Daily journal entries by the nursing staff were encouraged. Sample diary entries were provided in the educational PowerPoint presentation. The goal was that all members of the healthcare team could contribute entries if they chose, with parents writing in them as well. The diaries were available from October 2019 to January 2020.

**Budget Justification.** The budget for this project included the cost of clear binders, binder dividers-tabs, stickers, paper, and printing. The participating institution agreed to provide funds for these items. Estimated cost of binders was $40-60 with the goal of using them with 20 patients and families. Estimated cost of binder dividers-tabs was $30-40 for 20 binders. The estimated total cost was between $70-100.

**Measurement Methods**

Descriptive statistics were collected and included patient demographic information, including reason for admission to the PICU, PICU length of stay, and disposition after PICU discharge. These data points allowed for a better understanding of the types of patients who used the diary.

**Family Survey.** Families who used the diaries were surveyed after PICU discharge. Weekly check-ins were completed for enrolled families who had longer length of stays. Families had the option of completing the survey electronically or via mailed, hard copies. The surveys
were brief and included questions regarding the frequency of their entries, as well as their perception regarding the benefits of the ICU diary (see Appendix F: Parent Survey).

**Provider Survey.** The third aspect of measurement included process and system information from the providers who used and wrote in the diaries (see Appendix G: Nurse Survey). It was very beneficial to understand how often the diaries were used, how many entries were completed, and the time burden on the staff to complete their entries. If for whatever reason a family decided to use the diary but not provide feedback, nursing feedback and process information was still identified. Field notes were collected throughout the process from conversations with nursing staff who were actively involved in the project.

**Results**

**Nursing Survey Results**

A total of 21 RNs completed the survey. Twenty RNs indicated having a patient(s) participate in the ICU diary program. One RN did not have a patient participate in the diary program but chose to answer questions about the PICS educational component only. RN participants identified the frequency of entries as 10 participants indicated making 1-2 entries, 5 making 3-5 entries, and 4 making 6-10 entries respectively. Time burden was minimal; 85% indicated diary entries took 10 minutes or less to complete. The majority (90%) of the nurses surveyed indicated enjoyment in contributing to the diary project. Over half (61%) of nurses felt that after participating in the project that they had a better understanding of PICS. One RN indicated no increased knowledge of PICS and 7 were neutral. Nine respondents (45%) strongly agreed that participation in the project allowed for an additional avenue to have conversations with families about their psychologic/psychosocial needs, 5 (25%) somewhat agreed, 5 (25%) were neutral, and 1 (5%) respondent did not feel that the project allowed for this avenue.
Eighteen nurses (85%) agreed that the ICU diary would be a worthwhile intervention in the PICU. Three (15%) were neutral in identifying if the ICU diary would be worthwhile. The final questions allowed for open-ended responses to the strengths or benefits of the project. Several common themes were identified from the nursing staff’s comments regarding the diaries a.) it personalized nursing care, b.) provided a better sense of the child’s hospitalization, and c.) creative way to verbalize care in kid-friendly language (see Table 2). In addition, nurses provided suggestions for improvements which included recommendations for a reminder system, using the diaries for patients with a longer length of stay (LOS), and having a specific/permanent location for the diary.

Table 2

<table>
<thead>
<tr>
<th>Nursing Survey Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using the diaries with patients was a great way to personalize the care that I was providing. Parents seemed to enjoy seeing that we cared a lot about their child and their care.</td>
</tr>
<tr>
<td>Even though it can be extra work, I think it’s a good thing for patients and parents to be able to make better sense of what’s happening- and a cool thing for them to take home.</td>
</tr>
<tr>
<td>I thought it was a great idea for a project! One that I had never heard of before - intentional for both the family &amp; nursing staff.</td>
</tr>
<tr>
<td>I thought it was a great opportunity for the patient and family members to have something to look back on for both emotional and medical recalling. It makes the days stay separate and not flow together as much.</td>
</tr>
<tr>
<td>I imagine that this will be especially useful for families whose children come into the ICU very sick &amp; lots happens during the first few days. Those days tend to be a blur for families.</td>
</tr>
<tr>
<td>I think this diary is a great way to communicate to patients in a way you may not be able to otherwise.</td>
</tr>
<tr>
<td>Loved thinking about ways to verbalize things in kid-friendly ways. Loved thinking about the kids reading these when they grow up!</td>
</tr>
</tbody>
</table>

Family Survey Results

Two of the nine patients’ families completed the surveys. Both were from participants who did not make any diary entries. One mother responded that she looked at the diary post PICU discharge/transfer and the other denied looking at the diary post discharge. Both parents planned to share the diary with their children. Results on the benefit of the diary were split with
one parent saying that the diary benefitted them and the other parent answering neutral to this question. One parent felt that the ICU diary provided an increased understanding of her child’s ICU stay while the other parent disagreed with this statement. Similarly, one parent agreed that the PICU diary project gave them additional support in regard to emotional health/wellbeing while the other parent felt neutral towards this statement. Both parents shared positive feedback; one mentioning that the diary program was a great idea and another that it was something she would hold onto for a lifetime.

Discussion

The three aims of this pilot project included providing PICS education to frontline staff, implementation of ICU diaries, and evaluation of the use of the diaries. The educational methods, specifically PowerPoint presentations and informational worksheets, as described by Esses et al., (2019) and Herrup et al., (2019) were successfully received by the nursing staff as over half (61%) indicated a better understanding of PICS. This type of education was chosen due to its ability to reach a large audience. In addition, the PowerPoint presentation was loaded onto the hospital learning management system (LMS), which allowed the nursing staff to access and complete the education modules as their personal time allowed.

Implementation of the ICU diaries was facilitated by unit champions who were enthusiastic about the project and encouraged diary entries during each shift. However, despite this enthusiasm by the unit champions, there were some days that no entries were made in the patient’s diary. This issue was noted in the study by Herrup et al., (2019) when they reported only 21% of diaries had daily entries. Barriers to daily diary contributions should be identified and remedied to promote the ICU diaries intended purpose of reducing the risks associated with PICS.
Despite the obvious short-term family appreciation for the ICU diaries, the long-term benefits of reducing or avoiding PICS symptoms is yet to be determined. This pilot study did not determine the longitudinal benefits of the ICU diaries; however, the ICU diaries appeared to enhance the communication between the nurses and the patient/family during hospitalization. By increasing communication, patient and family satisfaction will ultimately increase and will lead to a positive ICU or hospital experience. Further, the diary promoted communication between the nurses and the patient/family in a simple, inexpensive manner.

Limitations

There were several limitations that were identified following project implementation. The first is the relatively small sample size of nine patients/families which does not allow the results of this pilot project to be generalized to a larger population. The participants were a convenience sample of patients/families in the PICU who may benefit from the project, which can also potentially affect generalizability. Thirdly, it was difficult at times to keep staff motivated to participate and adopt this new practice. The lack of diary entries may have impacted the responses of the patient/family participants and/or their rate of returned surveys. Lastly, the low response rates for the surveys, 20% and 34% for the parental and nursing surveys respectively, made it difficult to draw specific conclusions about the impact of the ICU diaries.

Future Implications

This pilot project gave valuable insight into improving communication with children and their families while in the ICU, but there is still so much more that can be done to better understand PICS and its impact on children. Future research is needed in order to quantify how many children are affected by PICS following an ICU hospitalization and what healthcare providers can do to minimize long-term implications. In addition, wide-spread education about
PICS for all pediatric healthcare providers would be beneficial so that signs and symptoms can be detected both while hospitalized and following discharge. Several adult centers throughout the globe have also begun to implement post-intensive care clinics where patients who have had prolonged critical illness and ICU stays can be closely monitored for PICS-related symptoms and treated by trained healthcare providers.

The sustainability of this pilot project will ultimately depend on further support from unit leadership. The unit is currently working on implementing elements of an ICU-liberation bundle similar to the ABCDEF bundle created by the SCCM. The ICU diary could be integrated into the Family Engagement section. Once incorporated into nursing practice, the relationship between the ICU diaries and its impact on PICS can be further explored.

**Conclusion**

The educational strategies used to inform PICU nurses about PICS proved to be an effective method to update nurses about this newly recognized condition in the pediatric population. ICU diaries were an inexpensive strategy to foster communication between the bedside medical providers and patient/families in the PICU. Further research is needed to better understand the impact of ICU diaries and its impact on PICS in the pediatric population.
Appendix A: University of Minnesota Medical Center IRB

### UNIVERSE OF MINNESOTA

**Hospital Research Protection Program**
Office of the Vice President for Research
Room 350-2
McNamar Alumni Center
200 Oak Street S.E.
Minneapolis, MN 55455
612-626-5654
irb@umn.edu
https://research.umn.edu/unvts/irb

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**NOT HUMAN RESEARCH**

August 22, 2019

Paige Naschke

pnasch1@fairview.org

Dear Paige Naschke:

On 8/22/2019, the IRB reviewed the following submission:

<table>
<thead>
<tr>
<th>Type of Review:</th>
<th>Initial Study</th>
</tr>
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<tbody>
<tr>
<td>Title of Study:</td>
<td>A Strategy to Decrease Post-Intensive Care Syndrome: The Use of ICU Diaries in the Pediatric Intensive Care Unit</td>
</tr>
<tr>
<td>Investigator:</td>
<td>Paige Naschke</td>
</tr>
<tr>
<td>IRB ID:</td>
<td>STUDY00007369</td>
</tr>
<tr>
<td>Sponsored Funding:</td>
<td>None</td>
</tr>
<tr>
<td>Grant ID:</td>
<td>None</td>
</tr>
<tr>
<td>Internal UMN Funding:</td>
<td>Departmental funding: The Pediatric Intensive Care Unit (PICU) at the University of Minnesota Masonic Children's Hospital will be providing funding for this project. The estimated cost is $100.</td>
</tr>
<tr>
<td>Fund Management Outside University:</td>
<td>None</td>
</tr>
<tr>
<td>IND, IDE, or HDE:</td>
<td>None</td>
</tr>
</tbody>
</table>

- ICU Diary Information Sheet, Category: Other;
- PICU Letter of Support, Category: Letters of Support / Approvals (Location);
- Nursing Survey, Category: Other;
- Naschke - IRB Submission Updated, Category: IRB Protocol;
- Parent/Guardian Survey, Category: Other;

The IRB determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations. To arrive at this determination, the IRB used “WORKSHEET: Human Research (HRP-310).” If you have any questions about this
Appendix B: Creighton University IRB

<table>
<thead>
<tr>
<th>DATE:</th>
<th>22-Aug-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO:</td>
<td>Naschke, Paige</td>
</tr>
<tr>
<td>FROM:</td>
<td>Social / Behavioral</td>
</tr>
<tr>
<td>PROJECT TITLE:</td>
<td>New Protocol Created for Paige Naschke on 07-Aug-2019 10:19 PM</td>
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<tr>
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<td>QIP Review</td>
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<tr>
<td>ACTION:</td>
<td>NOT HUMAN SUBJECTS RESEARCH</td>
</tr>
<tr>
<td>EXPIRATION DATE:</td>
<td></td>
</tr>
</tbody>
</table>

Thank you for your submission of Initial Application materials for this project. The protocol attached to this submission have been reviewed.

It has been determined this project does not meet the definition of research under 45 CFR 46.102(d). IRB review and oversight are not required.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact the IRB Office at 402-280-2126 or irb@creighton.edu. Please include your project title and number in all correspondence with this committee.
Institutional Review Board
Creighton University

July 11, 2019

I am writing this letter of support for Paige Naschke’s quality improvement project implementing ICU diaries on the Pediatric Intensive Care Unit.

Paige’s project will allow us to see if ICU diaries impact families in a positive way on our unit. We will determine if this method is a feasible way to document pieces of information for families and if it positively contributes to their time here. If this project is successful we would continue after the course of Paige’s quality improvement project. We look forward to working with Paige to assess the benefits of the project and the advantages it can offer us.

Sincerely,

[Signature]

Clare Evenson RN, MN, BS
Pediatric Intensive Care Unit Nurse Manager
University of Minnesota Masonic Children’s Hospital
Office 612-365-5009
Appendix D: About Me

PICU Diary Pilot Project

About Me…

Name: ______________________________

I Like to be Called: ______________________

About My Family: _______________________

_____________________________________________________________________________

Favorites:

Color: ________________________________

Movie/TV Show: ________________________

Music: ________________________________

Sport/Activity: __________________________

Book: ________________________________

Things that Scare/Stress Me: ______________

_____________________________________________________________________________

Things that make me Happy: ______________

_____________________________________________________________________________

Other Things you Should Know about Me: _______

_____________________________________________________________________________

Favorite Comfort Items

Blanket __ Pacifier __ Stuffed Animal __

Music ___ TV/Movies __

*Adapted from Locke et al., 2016
Appendix E: PICU Diary Information Sheet

**PICU Diary Project Pilot**

Pediatric Intensive Care Unit (PICU) diaries are a way of helping families understand what has happened to their critically ill child during a PICU admission. Studies have shown that ICU diaries are helpful in adult patients and several pilot projects have been completed in pediatric settings as well.

Although doctors and nurses explain to family members and patients the reason for admission to the PICU and the changes that occur on a daily basis, it is common to forget or misunderstand what medical staff have told them. It is also difficult for parents and family members to see their child in a critically ill state.

In addition, children who have been in the PICU may have little or no memory of their ICU stay. Their memory during this time can be affected by their illness itself or the sedative and pain medications we give to patients to keep them comfortable.

ICU diaries can help decrease symptoms of anxiety, depression and post-traumatic stress that may develop after PICU admission in both the patient and family members. Moreover, ICU diaries can help fill in memory gaps that often exist after a patient is discharged from the PICU.

The nursing staff and other medical staff members will make diary entries to explain what has brought your child to PICU, what is wrong with him/her and how he/she is progressing. All entries will be written in common language with a focus on daily events and milestones.

We encourage you and other family members to write in your child’s PICU diary. The diaries will be located in your child’s room in a common location. All entries should be written in ink, signed and dated. If you are in the PICU for longer than 1 week, staff members will follow up with you about your experience thus far with the diary.

When your child is well enough to leave the PICU, you will be able to take the diary with you if you wish. A follow-up survey will be mailed or electronically sent to you to gain information about your use of the diary; whether you found it beneficial or aspects that you enjoyed or would like added.

We appreciate your assistance in this pilot project that we are implementing in the PICU at the University of Minnesota Masonic Children’s Hospital. If you have any questions about the project, please feel free to reach out to your child’s nurse who will communicate with the project coordinators.

*Adapted from Herrup et al., 2019*
Appendix F: Parent Survey

**PICU Diary Project: Parent/Guardian Follow-Up Survey**

1. Relation to the patient who was admitted to the PICU?
   a. Mother
   b. Father
   c. Guardian
   d. Other: please specify

2. How many diary entries did you make?
   a. 0
   b. 1-2
   c. 3-5
   d. 6-10
   e. Greater than 10

3. How much time did you spend writing each diary entry?
   a. <5 minutes
   b. 5-10 minutes
   c. 10-15 minutes
   d. 15-20 minutes
   e. >20 minutes
   f. N/A

4. Did you enjoy contributing to the PICU diary?
   a. Yes
   b. Neutral
   c. No

5. Have you looked at the diary since PICU discharge/transfer?
   a. Yes
   b. No

6. Do you plan to share the PICU diary with your child?
   a. Definitely yes
   b. Probably yes
   c. Might or might not
   d. Probably not
   e. Definitely not

7. Do you think the PICU diary is something that benefits you as parents?
   a. Yes
   b. Neutral
   c. No
8. Do you think the PICU diary project gave you an additional level of support in regards to your emotional health or wellbeing? Ex. Referrals to chaplain/spiritual services or social work
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

9. Please describe any thoughts you have about the benefits or strengths of the PICU diary program?

10. Please describe any thoughts you have about improvements to the PICU diary program?

11. Are there any changes you would make to the PICU diary program that would make it more worthwhile for you or your child?
Appendix G: Nurse Survey

**PICU Diary Project Nurse Survey**

1. Did you have a patient participate in the PICU diary program?
   a. Yes
   b. No
2. How many diary entries did you make?
   a. 0
   b. 1-2
   c. 3-5
   d. 6-10
   e. Greater than 10
3. How much time did you spend writing each diary entry?
   a. Less than 5 minutes
   b. 5-10 minutes
   c. 10-15 minutes
   d. 15-20 minutes
   e. Greater than 20 minutes
4. Did you enjoy contributing to the PICU diary?
   a. Strongly agree
   b. Agree
   c. Somewhat agree
   d. Neither agree nor disagree
   e. Somewhat disagree
   f. Disagree
   g. Strongly disagree
5. Do you have a better understanding of post-intensive care syndrome (PICS) after participating in the project?
   a. Strongly agree
   b. Agree
   c. Somewhat agree
   d. Neither agree nor disagree
   e. Somewhat disagree
   f. Disagree
   g. Strongly disagree
6. Do you feel as though participating in this project allowed you an avenue to have conversations with parents/guardians about their psychologic or psychosocial needs?
   a. Strongly agree
   b. Agree
   c. Somewhat agree
d. Neither agree nor disagree

e. Somewhat disagree

f. Disagree

g. Strongly disagree

7. Do you think the ICU diary would be a worthwhile intervention that the unit could implement with all patients who are admitted for longer than 3 days?

  a. Strongly agree

  b. Agree

  c. Somewhat agree

  d. Neither agree nor disagree

  e. Somewhat disagree

  f. Disagree

  g. Strongly disagree

8. Please describe any thoughts you have about the benefits or strengths of the PICU diary program?

9. Please describe any thoughts you have about improvements to the PICU diary program?
References

Als, L. C., Nadel, S., Cooper, M., Pierce, C. M., Sahakian, B. J., & Garralda, M. E. (2013). Neuropsychologic function three to six months following admission to the PICU With meningoencephalitis, sepsis, and other disorders. *Critical Care Medicine, 41*(4), 1094-1103. doi:10.1097/ccm.0b013e318275d032


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doi:10.1097/ccm.0b013e31824e68cf


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doi: 10.3912/OJIN.Vol20No02PPT02


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Rockville, MD, Agency for Healthcare Research and Quality


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