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Characteristics of Low Acuity Unscheduled Transfers to the Pediatric Intensive Care Unit

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Characteristics of Low Acuity Unscheduled Transfers to the Pediatric Intensive Care Unit

Submitting/Presenting Author (must be a trainee): Dr. Ashley Daniel, MD

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Resident/Psychology Intern (\leq 1 month of dedicated research time)

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Other authors/contributors involved in project:

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IRB Number: Study00000552

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):

I performed an extensive literature review, which revealed that little work has been done on this topic historically. I wrote the research protocol and submitted to the IRB as primary investigator. I then worked extensively with the site coordinator for the Virtual PICU Systems (VPS) database and outcomes research faculty to analyze our data. The results of this project, entitled *Characteristics of Low Acuity Unscheduled Transfers to the Pediatric Intensive Care Unit* will be presented at the Society of Critical Care Medicine (SCCM) 49th Annual Congress on February 16, 2020 in Orlando, Florida.

Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words

Background:

Efforts at code prevention have prompted study of factors that result in emergent transfers to the ICU. While much is known about prolonged ICU courses for critical patients, little is described for those with short ICU stays. Low acuity admissions to the ICU may be a useful concept for describing short term patient populations that do not receive ICU-level therapy. We describe one pediatric hospital's experience with unscheduled ICU admissions from the inpatient floor that last less than 36 hours and the characteristics that differentiate them from patients who require longer admissions.

Objectives/Goal:

The objectives of this study included characterizing demographic patterns that exist within low acuity admissions to the ICU and describing the scope of ICU-level care that these patients receive.

Methods/Design:

This retrospective cohort study examined unplanned PICU transfers between January 2014 - March 2019 at a stand-alone pediatric hospital with a tertiary pediatric ICU. Data was collected using the Virtual PICU system (VPS®) and the hospital's internal electronic medical record (Cerner Corp). Patients were considered to have a low acuity, unscheduled ICU admission if they were discharged from the ICU within 36 hours and did not receive > 60 cc/kg in fluid boluses, positive pressure ventilation (noninvasively or invasively), or inotropic medication. Descriptive statistics were used to describe subpopulations within this cohort.

Results:

During the study period, 601 low acuity transfers from the general pediatrics ward occurred. Patient admissions were categorized by primary diagnosis. Of these admissions, 261 patients were admitted for respiratory causes with a mean probability of death (PRISM III score) of 0.78; 80 admissions for infectious diagnoses with a mean probability of death of 3.62; and 68 admissions for oncologic causes with a mean probability of death of 3.98. The most common interventions performed following ICU admission were: provision of high flow nasal cannula for respiratory support (43 times), ultrasound (33 times), advanced imaging by CT or MRI (47 times), echocardiogram (23 times), and attainment of vascular access by PICC placement (18 times).

Of the patients admitted for respiratory causes, the patients with highest probability of death were those in the adolescent age group (age 12-18 years), followed by children (2-5.99 years), and neonates (birth-27 days).

Conclusions: Most low acuity admissions to the ICU are respiratory patients, and few receive physiologic supports other than high flow nasal cannula. Infectious, symptom-based, and oncologic diagnoses have the highest risk of mortality in this cohort. Diagnostic workups serve to investigate more risky diagnostic categories that have a higher PRISM III risk of mortality. Approximately 25% of all admissions in this cohort are readmissions.

This study was limited by the inability to generalize this data from individual patients with the information available. Many patients had multiple diagnoses but were required to be categorized by one primary diagnosis. This study was retrospective, which limited the information available to collect.

In the future, we hope to direct a multi-institutional study to further characterize low acuity transfers in a prospective manner. Understanding predictor factors for a low acuity respiratory admission to the ICU may in the future help prevent unnecessary admissions to the pediatric ICU. Ultimately, this work could drive future practices changes in order to support low risk respiratory patients outside of the ICU.