

POSTER PRESENTATION SCHEDULE 10th Annual Johns Hopkins Critical Care Rehabilitation Conference			
Time	Presenter(s)	Title	Institution
Friday, November 5, 2021 - PM Session [Facilitators - Megan Hosey, PhD and Stephanie Hiser, PT]			
11:30 AM - 12:30 PM	Kimberly Johnson, MD	Stakeholder Feedback on Reading ICU Diary Entries Aloud in Real Time to Patients in the ICU	Mayo Clinic, Rochester, MN, USA
	Shannon Chou, PT	Rehabilitation of a Post Covid-19 Patient During 77 Days of Venovenous Extracorporeal Membrane Oxygenation	Vancouver Coastal Health, Vancouver, Canada
	Angela Perfetti, MSc	Traumatic Injury and ICU Recovery: Challenges and Opportunities for Families	Johns Hopkins Hospital, Baltimore, MD, USA
	Suzanne Bench, PhD, MSc, PGdipHE, BSc	Rehabilitation After COVID-19 Critical Illness: A Qualitative Study Exploring People's Experience and Recovery Needs	London South Bank University, London, England
	Abdelmagid Khaled, MD	The Impact of Under-Staffing Nurses on Sedative/Analgesic Agents Administration in Pediatric Intensive Care Unit (PICU)	University of Buffalo, Buffalo, NY, USA
	Anna Krupp, PhD, RN	Comparing An Electronic Mobility Safety Screen Prototype and Nurse Readiness Mobility Assessment to Activity Levels in ICU Patients Requiring Mechanical Ventilation	University of Iowa, Iowa City, IA, USA
	Niklas Obermeier, RN#	Relative Care in the Intensive Care Unit - Not Only During a Pandemic: Does an Active Relative Telephone Call Have a Positive Influence on the Need for Safety of Relatives?	Krankenhaus Barmherzige Brüder Regensburg Hospital, Regensburg, Germany

#: No poster received as of Oct 18, 2021



Stakeholder feedback on reading ICU diary entries aloud in real time to patients in the ICU

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Introduction

- Many survivors of critical illness suffer from negative psychological outcomes, which often become chronic¹
 - These disorders are part of Post-Intensive Care Syndrome and include anxiety, depression, and Post-Traumatic stress syndrome
- The largest modifiable risk factor for development of these conditions is recollection of frightening delusional ICU experiences²⁻⁵
- Prevention or alteration of these false memories may be possible during the initial time of memory formation and consolidation, which occurs while the patient is in the ICU
- Semantic processing is preserved even in the sedate patient making communication a possible means of intervening on false memory formation
- The ICU diary is a long-standing intervention aimed to improve psychological outcomes of critical illness survivors; although, the current literature is mixed regarding efficacy
- The efficacy of ICU diaries may be enhanced when applied in a real time aloud structure by providing orientating information during the time of memory formation
- Stakeholder feedback regarding the intervention is critical prior to proceeding with a larger efficacy trial of the intervention

Objective

- To obtain stakeholder feedback regarding a novel approach to ICU diaries in which written ICU diary entries are read aloud to the patients right after they are written, providing patients with systematic real-time orientation, and facilitating formation of factual memories.

Methods

- Single center qualitative study
- Participants: Patients (30), family members (3), nurses (31), physical and occupational therapists participating (8) in the care of enrolled patients
- Structured interviews including multiple choice and open-ended questions were recorded and transcribed
- Analysis: Qualitative analysis to identify common themes of responses

Results

- Main themes of patient and nurse responses are in table 1 and 2
- Themes related to implementation barriers by participating nurses included lack of time due to competing tasks (16) and need for standardization (9). Overall, the intervention was thought not be overly burdensome (19).

All family members liked the intervention.

*Family members participation was limited secondary to visitation limitations during COVID

- Specific example: "It also helps break down the barrier between staff and patients. It makes it more personalized and one-on-one"

Physical therapist and Occupational Therapist responses were similar responses to participating nurses with overall positive view of the intervention.

Unique to therapist responses was concern that some patients may be overwhelmed with hearing the about their course/illness while still in the ICU (4)
-These concerns were not shared by participating patients or nurses

Results

Table 1: Patient interview responses, N=30

Theme	Specific Examples
Overall positive view of the intervention (13)	<ul style="list-style-type: none">"I liked it very very much""It was pretty cool to see it from their point of view""I thought it was great.""I think it is a good program and I think it is a good thing to do.""It probably helps out a lot of people who are mentally stressed""I could see a lot of benefit""I will enjoy having it to take home""It is nice to remember what is going on because after all this time it is hard.""People talking to me and listening.""It is nice that they kept me updated each day...it made them more aware because they were part of that program""It helped with communication with the care team and my daughter."
The intervention was beneficial (19) Specifically, the reading aloud component (9) Specifically, having written diary (9)	<ul style="list-style-type: none">"I think reorienting is a good part just cause there is so much that happens that it is blurred""Yes, because everything is all confusing in the hospital and it straightens out what you really had done in your mind""I like the additional information""The more you know about stuff, the better you will be able to handle it."
Increase communication with patient and/or family (4)	<ul style="list-style-type: none">"It was very comforting""I mean it was touching""They see you and acknowledge you.""You know we would really like to have you guys talk to us because it makes us more alive. I think they forget that we are humans.""The nurses...have been writing little notes in there fore me...that means a lot."
Reorienting/informative (5)	
Finding the intervention comforting and further humanizing the ICU experience (8)	

Table 2: Nurse interview responses, N= 31

Theme	Specific Examples
Overall positive view of the intervention (18)	<ul style="list-style-type: none">"I think they are really helpful for patients and families""Great Idea""Overall I love it,""I think it would be really valuable.""I think it is a great addition to the unit."
The intervention provided benefit Specially, completion of the diary and creation of a narrative for the patient to reflect (21) Specially, the reading aloud component (13)	<ul style="list-style-type: none">"Having a history of what happened from a human standpoint is valuable. Hearing someone talk to them is valuable.""Sometimes people can forget to talk with patients that aren't able to talk back. It is a more mindful way of just going over these things.""I have always been a believer in speaking with patients and keep simulating their brain. Giving them a good recap of the day is beneficial.""The diary maybe does help to hold yourself accountable to communicate and could serve to help remind people more.""...Just a comforting voice talking to them instead of over them."
Improved communication Specially, improved communication and connection to patient (13) Specially, improved communication with families (11)	<ul style="list-style-type: none">"It helps patients understand what happened when they were here""Allowed me to meet my patient on common ground.""I think it is very helpful for the patient who comes out of confusion and now can reflect back on what happened and ask questions.""It helps them know where we are coming from.""I think it helps with communication with families as well because it help with continuity-we know what the previous nurses were telling the family""Encourages more positive communication.""Makes us bring things to the family level and put thing in non-medical terms"
Reorienting for patient (8)	<ul style="list-style-type: none">"Help reorient them""I read it to a patient and she was like "oh wow, yeah that makes more sense."

Conclusion

- Reading ICU diary entries aloud was viewed positively overall by patients, families, nursing staff, and therapists. Testing efficacy of this novel approach on psychological outcomes therefore appears warranted.

Acknowledgements

- Funding by the ZOLL foundation
- We thank participating patients for their time and insights during the hardship of their illness
- We also thank the participating medical, cardiac, and surgical intensive care unit staff, especially nursing staff, for their dedication to humanization of the intensive care experience of our patients and partnering with us to complete this study.

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Rehabilitation of a Post-COVID-19 Patient During 77 Days of Venovenous Extracorporeal Membrane Oxygenation

Shannon Chou, MScPT¹; Roxanne Jeavons, DPT¹
¹Vancouver Coastal Health

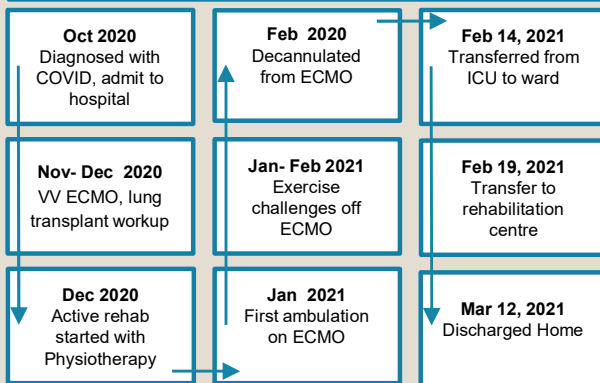
BACKGROUND & PURPOSE

- Novel coronavirus disease 2019 (COVID-19) pandemic has led to increased number of critically ill patients requiring life support on extracorporeal membrane oxygenation (ECMO).
- Current literature supports that early mobility in the ICU for the critically ill, including those who require venovenous ECMO (VV ECMO), is safe and feasible and also improves long-term functional outcomes.¹⁻²
- Limited evidence on exercise prescription while on VV ECMO, and the use of ECMO settings to facilitate participation in more activity.
- This case aims to investigate the potential use of VV ECMO to facilitate a high-intensity rehabilitation program using an example of a post-COVID ECMO patient.

CASE DESCRIPTION ³

- 59-year-old male with severe acute respiratory distress syndrome from COVID-19, supported for 77 days on VV ECMO.
- Cannulated with goals for bridge to lung transplant
- Remained cannulated to optimize rehabilitation outcomes despite meeting medical criteria for decannulation.

TIMELINE



INTERVENTION



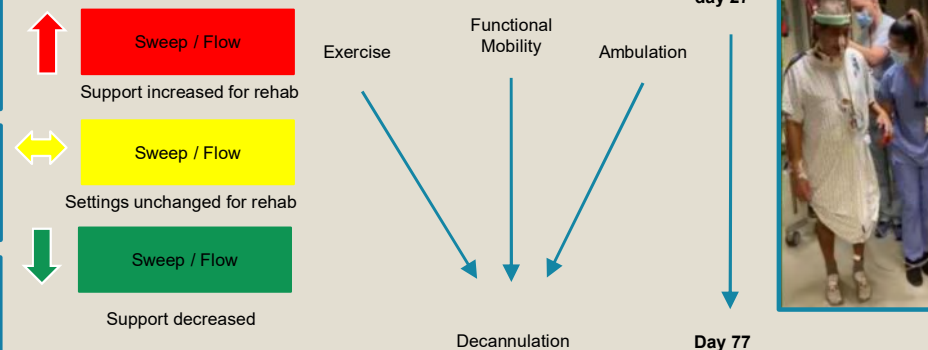
- 5-6x sessions per week
- 30-60min/session
- Progressive program; modifying distance, assistance, weight and repetitions
- ECMO support initially increased for therapy
- Weekly mobility sessions with sweep OFF

Functional Mobility

- Bed mobility
- Transfer to chair and commode

Ambulation

- Exercise
 - Seated dumbbell strengthening
 - Standing body weight
 - Cycle Ergometry



RESULTS

- No adverse events during rehab sessions
- Change in goals of care from bridge to transplant to bridge to recovery
- Improved functional independence.
 - Progressed from 2-person to supervised transfers
- ICU length of stay post-decannulation: 2 days
- Improved activity tolerance and ECMO support required
 - Progressed from platform walker to no aids
 - Ambulating up to 150m/day with sweep OFF

DISCUSSION & CONCLUSION

- This case supports the safety and benefits of pursuing rehab on VV ECMO.
- Unique utilization of VV ECMO to adequately support the patient to complete an intensive exercise program.
- Significant improvement in function and strength; increased activity tolerance and endurance during sweep off rehab sessions suggest gradual recovery of native lung function.
- There is a potential role for VV ECMO to be used to enable participation in a high intensity rehab program for those with severe pulmonary compromise.

FUTURE DIRECTIONS

- Future research with a control group and a large sample size is needed to determine the efficacy of optimizing VV ECMO to facilitate high-intensity rehab sessions.
- Community follow up post-discharge to explore long-term functional outcomes and activity tolerance for this population

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“Whoever did this to him, they did it to me:” Caregiver Experiences Following Critical Illness in Trauma

Angela Ross Perfetti, MSc; Sara Jacoby, MPH, MSN, PhD; Sruthi Buddai, BS; Meghan B. Lane-Fall, MD, MSHP, FCCM

Background

- Caregivers of ICU patients experience many deleterious psychological sequelae
- The unique context of critical illness after trauma is under-represented in the PICS literature
- There is sparse information about how caregiver experiences evolve over time, especially in trauma

Methods

- Prospective observational cohort study from a single trauma/surgery ICU
- Purposive sampling of patients with contributing factors for PICS, one caregiver self-identified
- Semi-structured interviews in ICU (baseline and setback visits), inpatient step-down and general wards, at inpatient rehabilitation facilities, and in patients' homes at 1 week, & 1, 2, 6, 9, and 12 months
- One round of open thematic coding followed by interpretive analysis, aiming to understand the subjective and constructed meanings of experience.

59 interviews

13 caregivers

7 mothers, 3 wives, 1 father,
1 neighbor, 1 fiancé



Summary of Results

- Both the injury and the hospital were sources of stress, anxiety, and sadness for caregivers
- In the hospital, caregivers experienced feelings of helplessness and lack of control and sadness at the pain their loved one was suffering, in addition to worry caused by the events surrounding to the injury
- Caregivers had many responsibilities over time: planning for future appointments, planning for a recovery-safe home, covering medical bills, and direct caregiving. These were experienced as overwhelming.
- Caregivers made many sacrifices: quitting a job, putting off their own health needs, etc.
- Patient/caregiver relationships changed in many ways; some had challenges communicating, and patients and caregivers sometimes different expectations of what it meant to support the patient through recovery.
- Some patient/caregivers grew closer together.

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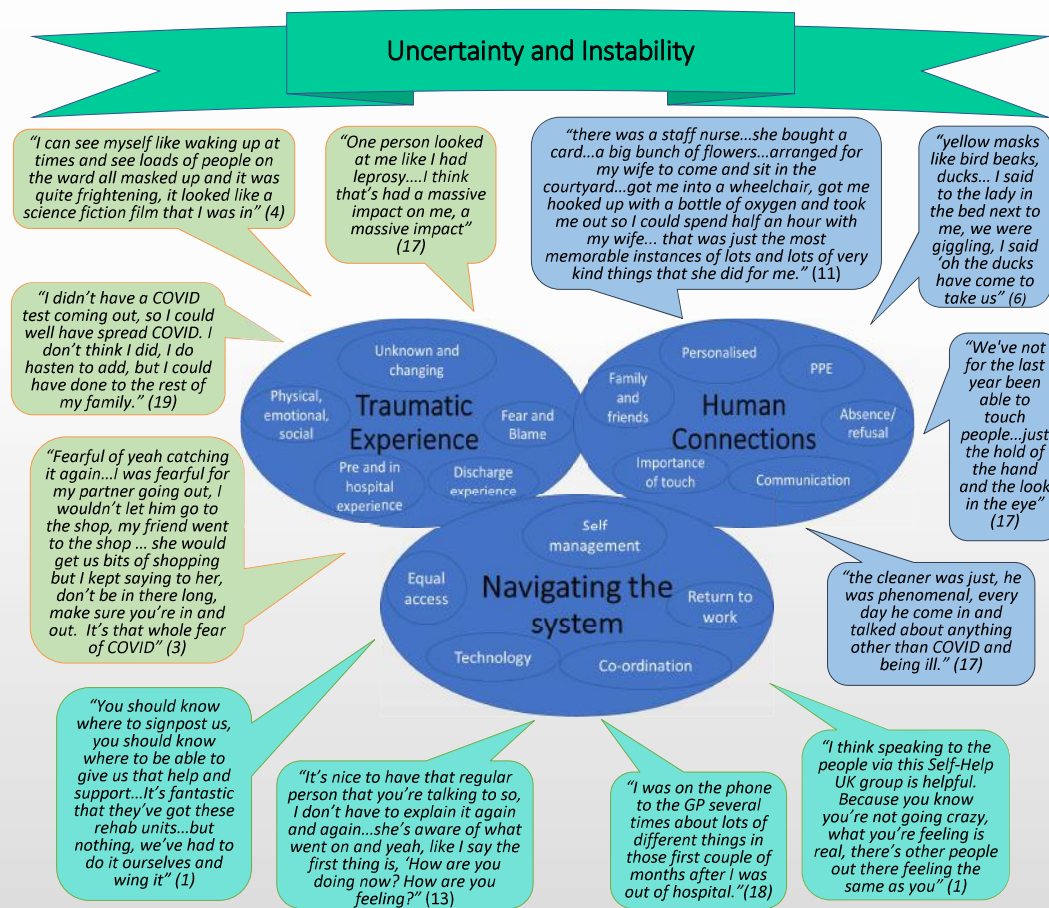
Rehabilitation and recovery following critical illness related to COVID-19

Bench S¹, Cherry H², Floyd H³, Hodson M⁴, James A¹, McGuinness N¹, Parker G⁴, Thomas N¹

¹London South Bank University, ²Patient Representative, ³NHS Seacole Centre, Epsom & St Helier NHS Trust, ⁴Central London Community Healthcare Trust

Background: Post intensive care syndrome is common after a critical illness, negatively impacting quality of life,¹ but we have little understanding of the additional impact of COVID-19.

Aim, Design, Methods: A qualitative study explored peoples' experiences of critical illness recovery after COVID-19. Semi-structured interviews with 20 UK survivors were conducted via a secure virtual platform (Microsoft teams, Zoom) or telephone September 2020-February 2021. Data underwent inductive thematic analysis. Participants included five women and 15 men aged 48-76; three healthcare employees, two bus drivers, one teacher and a taxicab driver; average hospital length of stay 3 months; 10 discharged to rehabilitation unit.



Key Messages:

Societal uncertainty & instability underpin the traumatic experiences of COVID survivors, affecting recovery. Survivors require a specialist, co-ordinated and personalised recovery pathway focused on the patient and family.

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1. Brown et al. Approaches to addressing post-intensive care syndrome among intensive care unit survivors. A narrative review. Ann Am Thorac Soc. 2019;16(8):947-956. doi:10.1513/AnnalsATS.201812-913FR



The Impact of under-Staffing of Nurses on Sedative/Analgesic Agents Administration in Pediatric Intensive Care Unit [PICU]

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Introduction

The impact of ancillary staffing ratios on provider workload and patient morbidity and mortality in critical care has been well-established. Per the American Association of Colleges of Nursing, the US is projected to experience a shortage of registered nurses. Few studies investigated nursing's impact on pediatric outcome and mostly focused on the level of education and experience. To our knowledge there has been no study to examine the effect of under-staffing on sedation utilization and needs in pediatric critical care.

Methods

Design:

Retrospective cohort study.

Patients:

Fifteen intubated children 0-21 years of age.

Duration:

September and October 2017 at the Women's and Children's Hospital of Buffalo. January and February 2018 at Oishei Children's Hospital.

We used **NEMS** [Nine Equivalent of nursing use Manpower score] as a way of evaluating the 'appropriateness' of nurse-patient ratio.

Appropriate shifts were defined as shifts with Nurse/Patients [N/P] ratio similar to that determined per NEMS.

Under-staffed shifts were shifts with N/P ratio less than determined per NEMS.

Sedation burden: extradoses of sedation or inc. rate of sedation infusion.

Significant sedation burden: ≥ 2 extradoses of sedation or ≥ 2 rate changes in sedation infusion.

Data Analysis

Descriptive analysis was used to describe baseline patients' characteristics.

Chi-square was utilized to analyze data for number of shifts with sedation burden [extradoses of sedation and rate changes of sedation infusion] per shift between appropriate and under-staffed shifts.

We used linear regression to adjust for difference in NEMS score between shifts to account for severity of illness.

Table 1. NEMS Components.

Item	Points
Basic monitoring: hourly vital signs, regular record and calculation of fluid balance.	9
Intravenous medication: bolus or continuously, NOT including vasoactive drugs.	6
Mechanical ventilatory support: Any form of mechanical/assisted ventilation, with or without PEEP (e.g., continuous positive airway pressure), with or without muscle relaxant.	12
Supplementary ventilatory care: Breathing spontaneously through endotracheal tube, supplementary oxygen any method, except if above applies.	3
Single vasoactive medication: Any vasoactive drug.	7
Multiple vasoactive medication: More than one vasoactive drug, regardless of type and dose.	12
Dialysis techniques: All.	6
Specific intervention in the ICU: Such as endotracheal intubation, introduction of pacemaker, cardioversion, endoscopy, emergency operation in the past 24 h, gastric lavage, routine interventions such as X-ray, echocardiography, electrocardiography, dressings, introduction of venous or arterial line, are NOT included.	5
Specific intervention outside the ICU: Such as surgical intervention or diagnostic procedure. The intervention/procedure is related to the severity of illness of the patient and makes an extra demand upon manpower effort in the ICU.	6

Results

Sed burden	appr.	Und staff	P-value
inc	48.2%(207)	59.1%(26)	0.17

Not inc 51.8%(222) 40.9%(18)

Appropriate VS Under-staffed and sedation burden.

Sed burden	1:1 or 2:1	1:2	P-value
inc	58.6%(112)	43%(121)	0.0009

Not inc 41.4%(79) 57%(160)

Nurse-patient ratio and sedation burden.

Sed burden	appr.	Und staff	P-value
Sig Inc	20%(86)	22.7%(10)	0.16

Not inc 80%(343) 77.3%(34)

Appropriate vs Under-Staffed Shifts and significant sedation burden.

Shifts	Inc	Not Inc	P-value
Appr Day Shifts [n=213]	48.1%[104]	51.9%[112]	0.32
Under-Staffed Day Shifts [n=22]	59.1%[13]	40.9%[9]	
Appr Night Shifts [n=213]	48.4%[103]	51.6%[110]	0.34
Under-Staffed Night Shifts [n=22]	59.1%[13]	40.9%[9]	

Appropriate vs Under-staffed (day and night) shifts and sedation burden.

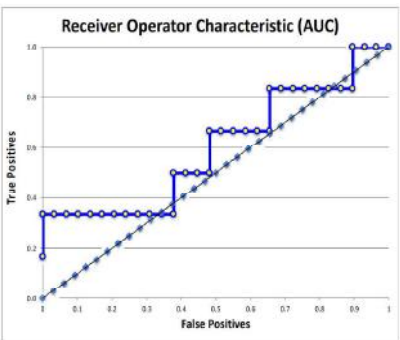


Figure 1. ROC for NEMS and admit PRISM.

Poor accuracy of NEMS matching higher acuity patients with better nursing ratio. $AUC=0.598$

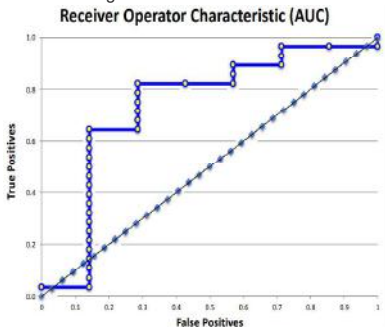


Figure 2. ROC for Actual-nurse patient ratio and admit PRISM.

Charge nurses matched higher acuity patient with better nursing ratio. $AUC=0.73$

Conclusion

We couldn't prove that understaffing would be associated with increase sedation. In our study group, there was increase sedation administration to patient when they had more nurses at their bedside. We believe that the group with lower nurse-patient ratio was under-sedated. It is difficult to know for sure, as we do not use sedation scores in our unit. Our study did not investigate the effect of this possible under-sedation on the outcome. We did not find NEMS score adequate for staffing of PICU as it did not correlate well with the patients' severity as determined by their admission PRISM score. Also, some acute changes occurred through shifts and can change the patient status and their staffing requirement.

We believe having an established sedation score and collecting these scores with the amount of sedation given during appropriate and under-staffed shifts might help controlling for some of the variables and give a more objective method to judge the patients' depth of sedation. More studies need to be conducted on the effect of nurse staffing and the amount of sedation.

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Comparing a Novel EHR Safety Screen Prototype and the Nurse Readiness Assessment to Activity Levels in ICU Patients Requiring Mechanical Ventilation

Anna Krupp, PhD, MSHP, RN; Heather Dunn, PhD, ACNP-BC, ARNP; Kelly Potter, PhD, RN, CNE

Introduction

Early mobility guidelines and protocols have increased the frequency of patients who walk during ICU admission, however

- Level of activity initiated varies by clinician
- Widespread implementation remains a challenge

Physiologic status is one key element in determining safety for out-of-bed (OOB) mobility interventions. A novel electronic health record (EHR) Safety Screen prototype was developed as potential intervention to help inform mobility decision-making

- Integrates safety recommendations^{1,2} with EHR data
- Logic includes trend information for assessments and interventions (e.g., blood pressure and vasoactive support) over 24-hour time period

Performance of a novel EHR Safety Screen prototype for identifying patient safety for OOB mobility interventions is unknown related to the current standard of care for nurses (RN Readiness Assessment)

Objective

Compare EHR Safety Screen prototype and RN Readiness Assessment against the highest activity level documented

Methods

Secondary review of EHR data between 2016-2019 in one Midwest tertiary medical center

Inclusion criteria: ≥ 24 hours of mechanical ventilation, ICU admission ≥ 72 hours, discharged alive

Exclusion criteria: Non-ambulatory prior to hospital admission

Methods, cont.

Measured association between **EHR Safety Screen prototype** or **RN Readiness Assessment** and **Activity Level** using Spearman's correlation

EHR Safety Screen Prototype



- 38 measures grouped into 4 domains (cardiovascular, respiratory, neurologic, other)
- Each domain categorized as safe/unsafe
- Unsafe score in 1+ domains = overall unsafe score

RN Readiness Assessment



- First day shift RN assessment of mobility level on ICU day 3
- 11 documented levels categorized as: in-bed, OOB.
- Any in-bed assessment = unsafe score

Activity Level



- RN and PT flowsheet documentation of activity done
- Highest level documented during ICU Day 3

Results

Activity Level	EHR Safety Screen Prototype n=1,657		RN Readiness Assessment n=1,657	
	Safe for OOB n (%)	Unsafe for OOB n (%)	Safe for OOB n (%)	Unsafe for OOB n (%)
Out of bed				
Stand	1 (0)	11 (1)	3 (0)	9 (1)
Chair	68 (4)	235 (4)	113 (7)	190 (11)
Walk	57 (3)	137 (3)	126 (8)	68 (4)
Bed				
Bed	152 (9)	966 (58)	46 (3)	1072 (65)
Passive chair	4 (0)	0 (0)	0 (0)	4 (0)
Dangle	11 (1)	15 (1)	0 (0)	26 (2)
Total	293 (18)	1364 (82)	288 (17)	1369 (83)

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Conclusions

Similar proportions of patients were assessed as safe for OOB activity, however there is wide variability in subsequent activity level and no correlation between either assessment and activity.

The EHR Safety Screen Prototype and RN Readiness Assessment require re-examination for sensitivity and specificity as more patients achieved OOB activity than screened as safe by either tool.

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