

RESEARCH ORAL POSTER PRESENTATION AWARD WINNERS

RS1: A Correlation Study to Evaluate Point-of-Care INR Testing in Children

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Purpose: Multiple studies have validated use of point-of-care (POC) devices in adults to monitor anticoagulation therapy using warfarin, although studies validating use in children are limited. The aim of this study was to determine whether international normalized ratio (INR) results obtained by the Coag-Sense POC PT/INR monitoring device via finger stick are similar to the standard venous INR results and, therefore, whether the Coag-Sense device is a safe alternative to support anticoagulation monitoring in children who require long-term warfarin therapy. **Background/Significance:** Patients requiring oral anticoagulation using warfarin require frequent blood testing of the INR to maintain values within a prescribed therapeutic range. Currently in our pediatric facility, patients receiving warfarin attend certified laboratories to obtain INR values via venipuncture, interrupting school and parents' work schedules. Findings from multiple clinical trials support use of capillary POC INR monitoring devices in adults, although studies in children are limited. **Method:** This was a prospective correlation study of pediatric patients receiving warfarin therapy at a tertiary care pediatric facility. Two samples were obtained in the laboratory from each participant for comparison: a venous INR blood sample, followed by a capillary blood sample processed per Coag-Sense PT/INR device manufacturer instructions. Scatter plots with linear regression showed the correlation between POC and laboratory INR results. The Pearson correlation coefficient was calculated to determine the strength of the linear relationship between the 2 INR results. Agreement between POC and laboratory INR values was assessed using a Bland-Altman plot. P less than .05 was considered statistically significant. **Result:** Thirty-six paired INR data points, POC and laboratory values, were collected from 7 participants. The median age was 12.7 (range, 11.4-18.0) years. Target INR goals for each participant were within 1 of 3 ranges: 1.8-2.5, 2.0-3.0, and 2.5-3.5. The correlation between laboratory INR and POC INR values was strongly positive (Pearson coefficient, 0.97; 95% CI, 0.80-0.95; $P < .001$). The scatter plot of laboratory INR values against POC INR values for the 36 pairs identified 23 pairs as concordant. Using Bland-Altman analysis, the mean difference bias was -0.053 (95% CI, -0.64 to 0.54).

Conclusion: The Coag-Sense POC PT/INR monitoring device is highly reliable in the pediatric population, resulting in good correlation between POC INR and laboratory INR values. Point-of-care self-testing, when performed accurately, can be a safe alternative for monitoring pediatric patients who take warfarin. Additional studies are needed to evaluate self-testing in children.

RS2: Development and Testing of the Moral Comfort Questionnaire for Nurses

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Purpose: To do a psychometric evaluation of a new 35-item instrument, the Moral Comfort Questionnaire (MCQ), for measuring moral comfort in nurses.

Background/Significance: Moral distress has a detrimental impact on nurses, patients, and health care organizations. Moral distress results from the residual psychological burden experienced when nurses are unable to act on ethical decisions. Conversely, moral comfort refers to the nurse's feelings of ease with decisions or actions related to ethical problems. However, literature on moral comfort is sparse.

Although many instruments to measure moral distress exist, no instruments to measure moral comfort were found. As such, the MCQ was developed. **Method:** A psychometric evaluation design was used.

Participants completed the MCQ and the Moral Distress Scale-Revised (MDSR). Reliability testing included Cronbach α values and test-retest reliability (Spearman correlation coefficient, weighted κ , and Bland-Altman analysis). Validity was examined using content-expert evaluation and discriminant validity ($r \leq \pm 0.30$). Model fit of a proposed 5-factor model was tested using confirmatory factor analysis (CFA). **Result:** A total of 466 nurses completed the MCQ and MDSR. The Cronbach α was 0.95, suggesting strong internal consistency. The Spearman correlation coefficient ($r = 0.60$) showed a strong correlation between MCQ time 1 and time 2. Weighted κ values (0.14-0.56) showed slight to moderate agreement between responses over time. The Bland-Altman plot showed agreement of responses over time. No correlation was shown between the MCQ and MDSR ($r = -0.22$), suggesting discriminant validity. Confirmatory factor analysis results revealed poor model fit. A post hoc hierarchical cluster analysis revealed 2 item clusters. A subsequent 2-factor exploratory factor analysis showed items loading onto 1 of the 2 factors (internal and external). **Conclusion:** Moral comfort in nurses is essential to promoting positive outcomes for nurses. Therefore, an instrument to measure moral comfort in nurses is needed. The MCQ was developed and tested. Results suggest

validity and reliability of the MCQ with additional testing of a 2-factor model. Knowledge acquired from studies using the MCQ may aid development of strategies to promote moral comfort in nurses, thereby promoting positive outcomes for nurses, patients, and health care organizations.

RS3: Responding to Ethical Issues and Operationalizing Nurses' Insights to Develop Ethical Resilience

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Purpose: This research was guided by the following aims: to identify ethical challenges that intensive care unit (ICU) nurses faced during COVID-19; to understand nurses' perceptions of how they made good decisions and provided good care when faced with ethical challenges; and to determine the extent to which nurses drew upon moral resilience to overcome ethical challenges they encountered. **Background/Significance:** Nurses adapted to ever-changing system and process conditions during the pandemic; however, the impact of ethical challenges they faced has not been fully described. Ethical challenges could result in moral distress that could decrease job satisfaction and trigger clinical nurses to leave their job. Ethical or moral resilience is an antidote to moral distress in nursing. **Method:** This qualitative study used narrative survey responses and semistructured interviews. After institutional review board approval, 798 ICU nurses from a large health care system received an email request to participate. If nurses indicated they had encountered an ethical challenge, they were asked to provide details about the ethical challenge, how they made good decisions, and how they provided good care. Nurses were asked to participate in a semistructured interview to explore experiences in more depth. Data were analyzed by summative content analysis, a systematic coding and categorization approach to analyze text and identify patterns to develop larger themes. **Result:** Forty-nine nurses completed surveys and 7 completed interviews. Ethical challenges were grouped into 5 themes: implementation of a strict visitation policy; patients dying alone; surrogate decision-making; diminished patient safety and quality of care; and imbalance and injustice between ICU interdisciplinary teams. Nurses' responses to ethical challenges were grouped into 4 themes: personal strength and values; problem-solving; teamwork and peer support; and resources. Although some nurses described using moral resilience approaches to overcome moral distress, no nurse demonstrated all facets of moral resilience (ie, personal integrity, relational integrity, moral efficacy, response to moral adversity). **Conclusion:** Nurses described

ethical challenges related to COVID-19 practice changes; ability to provide safe, high-quality care; family presence; decision-making; and inequality among health care team members. Nurses demonstrated some moral resilience approaches and, importantly, they developed effective approaches to address ethical challenges. Because cultivation of moral resilience is known to mitigate the effects of moral distress, nursing ethics education is needed.

Disclosures: Nancy Albert is a consultant for Boston Scientific, Merck, AstraZeneca, Cytokinetics, Eli Lilly/Boehringer Ingelheim, American Regent, and Impulse Dynamics. She has received research grants from AstraZeneca and Novartis.

RS4: Triggers of ICU Memories for Survivors of Acute Respiratory Distress Syndrome (ARDS) and COVID-19 ARDS

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Purpose: This study of intensive care unit (ICU) survivors of acute respiratory distress syndrome (ARDS) and COVID-19 ARDS aimed to (1) analyze survivors' memories of their ICU stay and identify sensory triggers of traumatic memories after discharge, and (2) determine if differences exist between ARDS and COVID-19 ARDS survivors' most vivid memories and sensory triggers for memories. **Background/Significance:** Acute respiratory distress syndrome is a risk factor for post-intensive care syndrome. Previous studies indicated that posttraumatic stress disorder sequelae were present in 27% to 39% of ARDS survivors, and psychiatric symptoms such as anxiety and depression were present in 66% of survivors. Patients admitted to an ICU with COVID-19 ARDS exhibit clinical features mirroring those seen in ARDS, but there are differences in clinical management. It is unknown whether survivors of COVID-19 ARDS experience psychological sequelae after discharge that are similar to those of patients with ARDS. **Method:** This study enrolled survivors of ARDS and COVID-19 ARDS admitted after January 1, 2020. Participants were recruited through Facebook ARDS survivorship and COVID-19 groups, flyers at pulmonary practices, word of mouth, and media interviews. Collection took place in person and via Zoom. Open-ended questions in a semistructured interview format were used. Thematic analysis of deidentified participant responses pertaining to vivid memories of ICU stay and sensory triggers (ie, visual, auditory, olfactory, tactile) of traumatic memories was conducted by 7 members of the research team. Codes were discussed, consensus was reached, and a code book was developed for subsequent coding. **Result:** Responses from 16 survivors

were analyzed (44% were ARDS survivors; 56% were COVID-19 ARDS survivors). Major themes identified across both groups included the following: (1) vivid memories, including altered reality (which included emergence delirium, sensory to dream conversion, and illusions or hallucinations), vivid nonsense dreams, medical treatment or procedures, and feeling lonely or isolated; and (2) common sensory triggers after discharge, which included seeing doctors, nurses, hospitals, and medical equipment or seeing or hearing media depictions of them, hearing ringtones and beeping or alarms, seeing or hearing helicopters, smelling cleaning products, and seeing or touching scars. No major differences were noted between groups in terms of memories and triggers. **Conclusion:** Our findings show survivors of ARDS and COVID-19 ARDS experience similar psychological sequelae and triggers. Collecting qualitative data on ICU memories and triggers for traumatic memories is important for understanding the impact of post-intensive care syndrome on ICU survivors' lives, but also for the development of treatments. These data are being used to develop a compressed exposure therapy intervention to desensitize survivors to common sensory triggers they encounter after hospital discharge.

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RS5: Changes in Oral Health of Older Adults Not Receiving Ventilatory Support During Hospitalization

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Purpose: Nonventilator hospital-acquired pneumonia (NV-HAP) is a prevalent health care-related infection associated with increased mortality, costs, and hospital length of stay. This study aimed to (1) explore oral care practices for hospitalized patients not receiving ventilatory support; (2) assess oral health status changes across the hospitalization period; and (3) compare baseline oral health status between patients admitted to the hospital from home versus a nursing home. **Background/Significance:** Nonventilator hospital-acquired pneumonia develops from aspiration of oropharyngeal secretions into the lungs and can occur more frequently in certain patients depending on contributing clinical factors. Consistent oral care is an effective preventive measure against NV-HAP that warrants further study within the nonventilated hospitalized population. **Method:** A prospective, exploratory study design was used to recruit, within 72 hours of hospital admission, 47 older adults (aged ≥ 65 years) who did not require ventilatory support. This subanalysis is part of a larger parent study exploring changes in the oral microbiome over time during hospitalization.

Patients were recruited from step-down units at a large tertiary medical center. Twenty-eight of 47 patients had data collected across all the following time points: baseline and days 3, 5, and 7. Oral health status was assessed using the Oral Health Assessment Tool (OHAT), for which scores range from 0 to 16, with higher scores indicating worse oral health. Data were analyzed using descriptive and nonparametric repeated-measures statistics.

Result: Most patients were female (82%); their median age was 78.5 years. Oral care was completed a mean of 0.8 times per day. Toothbrushing and toothpaste were most frequently used for oral care. Barriers to oral care included inadequate supplies (57%), no help (36%), and patients lacking energy (29%). Oral Health Assessment Tool scores significantly worsened across time ($P < .001$). Mean scores at baseline and days 3, 5, and 7 were 6.21, 6.50, 7.39, and 7.61, respectively. Significant differences were found between baseline and days 5 and 7 ($P < .001$) and between day 3 and days 5 and 7 ($P = .003$ and $P < .001$, respectively). Patients admitted to the hospital from a nursing home had significantly higher baseline OHAT scores compared with patients admitted from home (10.3 vs 4.6; $P < .001$). **Conclusion:** Oral health worsened across hospitalization in older adults not receiving ventilatory support. Patients admitted to the hospital from a nursing home already had poor oral health upon admission. Clinical practice implications include ensuring adequate oral care supplies, education about the importance of consistent oral care, and integration of oral care within routine clinical care. Future research should consider individualized preventive measures against NV-HAP tailored toward high-risk groups.

RS6: Changes in Telomere Length and Indicators of Oxidative Stress in Adults Receiving Mechanical Ventilatory Support

Zhan Liang, Elaine Saugar, Arsham Alamian; University of Miami, School of Nursing & Health Studies, Coral Gables, FL

Purpose: This pilot project is intended to report changes in telomere length (ie, relative telomere repeat copy number to single-copy gene copy number [T/S ratio]) and indicators of oxidative stress (ie, serum protein carbonyl, vitamin C, reduced glutathione [GSH] to oxidized glutathione [GSSG] ratio, and total antioxidant capacity) from intensive care unit [ICU] admission to ICU discharge, and to explore their association with ICU morbidity (using Acute Physiology, Age, and Chronic Health Evaluation III [APACHE III] and Sequential Organ Failure Assessment [SOFA] scores). **Background/Significance:** Telomeres are structures at the end of chromosomes that shorten with each cell division. Critically ill

patients typically develop an inflammatory and hypermetabolic state, which facilitates the production of reactive oxygen species and other oxidants that can damage DNA. Damage to DNA promotes cell division, leading to telomere attrition. It is unclear if the oxidative stress experienced during critical illness accelerates telomere attrition. **Method:** We enrolled 25 patients receiving mechanical ventilatory support who were at least 18 years old. The patients were enrolled within 48 hours of ICU admission, and they expected to remain in the ICU for at least 4 days. Blood samples were collected at enrollment and within 48 hours of ICU discharge. The T/S ratio from peripheral blood mononuclear cells was determined using real-time quantitative polymerase chain reaction. Enzyme-linked immunosorbent assay was used to determine serum concentrations of protein carbonyl and vitamin C, the GSH:GSSG ratio, and total antioxidant capacity. Descriptive analysis, paired *t* tests, and Pearson correlations were performed. **Result:** The mean (SD) age of participants was 62.0 (12.3) years, 29% were male, and 76% were White. The mean (SD) disease severity scores according to the APACHE III and SOFA tools were 74.6 (24.6) and 7.6 (3.2), respectively. Comparing measurements during and after ICU stay, the T/S ratios shortened (ICU: 0.712; post-ICU: 0.683; $P < .001$; $n = 19$) and mean [SD] serum protein carbonyl concentration increased (ICU: 7437 [3328] nmol/mg; post-ICU: 10254 [3962] nmol/mg; $P = .01$). The mean [SD] oxidative stress index values were higher for the post-ICU measurements (ICU: 1049.972 [420.923]; post-ICU: 1348.971 [417.175]; $P = .01$). The T/S ratio was associated with APACHE III scores (ICU: $r = 0.47$, $P = .04$; post-ICU: $r = 0.63$; $P = .004$). **Conclusion:** Findings from this study suggest that critical illness significantly correlates with telomere attrition, most likely owing to increased oxidative stress. Larger and longitudinal studies investigating mechanisms of telomere attrition and associations with clinical outcomes are needed to identify potential modifiable factors for subsequent intervention to improve outcomes for critically ill patients.

RS7: Cognition, Physical Function, and Psychological Symptoms in Intensive Care Unit Survivors

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Purpose: This observational study aimed to (1) examine the association of cognitive status, physical function, and symptoms of depression, anxiety, and posttraumatic stress (PTS) in intensive care unit (ICU) survivors at ICU discharge and 1 month after ICU discharge; and (2) examine delirium status and its relationship to cognitive status, physical function,

and symptoms of depression, anxiety, and PTS in ICU survivors at ICU discharge and 1 month after ICU discharge. **Background/Significance:** Post-intensive care syndrome (PICS) involves new or worsening impairment in cognition, physical function, or psychological health (ie, symptoms of depression, anxiety, and PTS) after a critical illness. It affects 25% to 50% of adult ICU survivors. Delirium is a risk factor for PICS, most notably cognitive impairment. Although the compounding of PICS impairments could intensify the syndrome, there is limited research regarding relationships among impairments, particularly in the context of delirium. **Method:** This descriptive, correlational study included adults who survived a stay of 24 hours or longer in a medical respiratory ICU of an urban, academic medical center. Participants completed measures for cognition, functional status, overall physical functioning, depression, anxiety, and PTS at ICU discharge and 1 month after ICU discharge. Delirium status was determined through review of the delirium screenings documented by the ICU nurses in the electronic health record. Spearman correlations were used to examine relationships among PICS impairments, and *t* tests were used to assess for differences in PICS impairments between those who experienced delirium in the ICU and those who did not. **Result:** Fifty participants were enrolled; data collection was completed for 46 patients at ICU discharge and for 35 patients at 1 month after ICU discharge. Most participants ($n = 31$; 67%) had 1 or more days without a documented delirium screening. Cognitive impairment was the most common PICS impairment. A positive correlation was found between cognition and functional status at ICU discharge ($\rho = 0.50$; $P < .001$) and 1 month after ICU discharge ($\rho = 0.54$; $P < .001$). Cognition and overall physical functioning were positively correlated at 1 month after ICU discharge ($\rho = 0.46$; $P = .006$). There were also moderate to strong correlations among all psychological symptoms. Scores did not differ on the basis of delirium status. **Conclusion:** The findings suggest a moderate correlation between cognition and physical function. More research is needed to explore this relationship, because ICU survivors with undiagnosed cognitive impairment may have delayed physical recovery and greater risk for injury. Cognitive impairment after critical illness is prevalent and underrecognized, highlighting a need for screening. The associations among psychological symptoms indicate the need for a comprehensive approach to screening and management.

RS8: Correlation of Telomere Length and Oxidative Stress With Indicators of Post-ICU Outcomes in Critically Ill Adults

Zhan Liang, Arsham Alamian, Elaine Saugar, Charles Downs; School of Nursing and Health Studies, University of Miami, Coral Gables, FL

Purpose: This pilot project is intended to report the relationship of both telomere length and indicators of oxidative stress to post-intensive care unit (ICU)-related outcomes (physical: handgrip and foot strength; cognitive: executive function and memory; and psychological: anxiety and depressed mood) among ICU survivors who received mechanical ventilatory support during their ICU stay. **Background/Significance:** Muscle weakness, impaired cognition, and an alteration in mood are common after critical illness. However, the biology underpinning their development is unclear. Oxidative stress, an imbalance in prooxidants and antioxidants, is a key feature of critical illness and may accelerate shortening of telomeres, structures at the ends of chromosomes. Perhaps oxidative stress and/or telomere shortening are associated with ICU-acquired muscle weakness, cognitive impairment, and mood disturbance. **Method:** Blood samples were obtained from patients receiving mechanical ventilatory support (n=25) at enrollment and within 48 hours of ICU discharge. Telomere length (ie, relative telomere repeat copy number to single-copy gene copy number [T/S ratio]) was determined using real-time quantitative polymerase chain reaction. Protein carbonyl, vitamin C, ratio of reduced glutathione (GSH) to oxidized glutathione (GSSG), and total antioxidant capacity were measured via enzyme-linked immunosorbent assay. Two oxidative stress indices were calculated (carbonyl/GSH:GSSG ratio, and vitamin C/GSH:GSSG ratio). Post-ICU outcomes included dynamometer readings of handgrip and foot strength, National Institutes of Health (NIH) Toolbox Cognition and Emotion measures, Connor-Davidson Resilience Scale, and clinical outcomes (ICU and hospital length of stay, and duration of mechanical ventilation). Pearson correlations were performed. **Result:** Mean (SD) age was 62.0 (12.3) years, 29% of patients were male, and 76% were White (Hispanic and non-Hispanic). Disease severity was determined using Acute Physiology, Age, and Chronic Health Evaluation III (mean [SD], 74.6 [24.6]) and Sequential Organ Failure Assessment (mean [SD], 7.6 [3.2]) scores. Foot strength negatively correlated with GSH:GSSG ratio (ICU and post-ICU), hospital and ICU length of stay, and duration of mechanical ventilation. Post-ICU executive function (NIH Toolbox Cognition) negatively correlated with measures of oxidative stress (vitamin C at ICU and vitamin C/GSH:GSSG ratio post-ICU) and ICU length of stay. Resilience score positively correlated with total antioxidant capacity. ($P < .10$ for all.) **Conclusion:** Oxidative stress generated during critical illness may contribute

to ICU-acquired muscle weakness, cognitive impairment, and psychological symptoms. As a result, these may affect ICU and hospital length of stay, as well as duration of mechanical ventilation.

RS9: Critical Access Hospital Nurses' Qualitative Reports of End-of-Life Obstacles

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Purpose: To collect and analyze the reported obstacle stories and experiences in providing end-of-life (EOL) care to dying patients from nurses working in critical access hospitals (CAHs). An open-ended response question was developed to help understand the EOL obstacle experiences of rural nurses working in CAHs. Participants' responses to this 1 open-ended item were analyzed for this report. **Background/Significance:** With high ICU mortality rates comes the need for EOL care, which is primarily performed by critical care nurses (CCNs). End-of-life care for ICU patients has been studied in urban settings; reports of nurses' perceptions of EOL obstacles and helpful behaviors were included. However, it is unclear if those same perceptions are also present in rural communities with nurses working at CAHs, where the demands of nursing practice can vary greatly from urbanized areas. **Method:** Quantitative data from an exploratory, cross-sectional study were analyzed. Critical access hospital nurses were asked to share experiences they had caring for a dying patient that illustrate the obstacles in CAHs. Responses were independently reviewed by researchers to obtain both the number of participants and individual responses. Each experience was individually analyzed for content theme. After individual classification, researchers met to compare content themes for each item. Discussion ensued for each item until there was a consensus. Once items were categorized, frequency counts for each category were completed and like items were grouped together. **Result:** A total of 64 nurses provided 96 categorizable responses (some provided more than 1 response). The 2 major groupings of responses were (1) family, physician, and ancillary staff issues and (2) nursing, environment, protocol, and miscellaneous issues. For the first grouping, 3 major subcomponents included issues with family behaviors, issues with physician behaviors, and a lack of supportive staff (eg, social workers, chaplains, secretarial staff). For the second grouping, the major subcomponents included issues directly involving nurses, improving the EOL environment, recommendations for EOL protocols, and other miscellaneous suggestions that did not fit into the other groups. **Conclusion:** Analysis of these data reveals common obstacles CAH nurses have

experienced in providing EOL care to dying patients. Critical access hospital nurses experience many obstacles in providing EOL care. These obstacles appear in both urban hospitals and in CAHs. Unfortunately, no substantial strides have been noted in decreasing those obstacles. Using a multifaceted approach may be an effective way to reduce EOL obstacles, giving each patient a dignified death. More research is needed regarding EOL care in CAHs.

RS10: Development and Preliminary Psychometric Testing of a Tool for Measuring Knowledge About Atrial Electrograms (DAEGAS)

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Purpose: To test the preliminary psychometric performance of the newly developed Drake Atrial Electrogram Assessment Survey (DAEGAS) by assessing evidence for content validity, internal consistency, and stability reliability. **Background/Significance:** It is essential that critical care nurses (CCNs) who care for cardiac surgery patients recognize dysrhythmias postoperatively and implement appropriate and timely interventions. Atrial dysrhythmias frequently occur during the first few days after cardiac surgery. Critical care nurses who care for postoperative cardiac surgery patients can likely improve their care through specialty knowledge such as understanding atrial electrograms (AEGs). An inadequate audit trail exists for psychometric performance of instruments to measure knowledge of AEGs. **Method:** The DAEGAS is a 20-item, multiple-choice response, self-administered, paper-and-pencil instrument to measure knowledge and interpretation of AEGs. A panel of 6 AEG experts reviewed the DAEGAS for content validity. The instrument was further revised (version 2) to 19 items ($n = 13$ knowledge items and 6 AEG interpretation items) and tested with 76 CCNs from the greater Houston metropolitan area. These nurses care for patients after cardiac surgery who have temporary atrial pacing wires. **Result:** The content validity index was 0.93, Cronbach α was 0.51, and test-retest r was 0.74. Cronbach α increased to 0.60 and r to 0.73 with removal of 3 items: 2 items with a negative item-total correlation and 1 item that was transitioned to a sample question. Content validity evidence exceeded the a priori criterion. Internal consistency and stability reliability estimates did not meet the a priori criterion, albeit the latter did meet the criterion recommended by psychometricians for a new instrument. Critical care nurses are unaware of or have limited experience with AEGs. **Conclusion:** Potential uses of the DAEGAS, with adequate reliability estimates, include evaluation of the effectiveness of clinical and/or

academic educational content related to AEGs. DAEGAS scores may be helpful for identifying content needed to improve knowledge for experienced CCNs, newly hired nurses (ie, testing during orientation), and nurses transitioning into cardiac critical care units.

RS11: Empowering Nurses to Activate Rapid Response Teams

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Purpose: Nurses' confidence in their assessment skills plays an integral role in activation of rapid response teams (RRTs) and preventing failure to rescue (FTR). High-fidelity simulation in situ combined with scripting were used to increase nurse confidence and thereby decrease delays in activating an RRT. **Background/Significance:** Incidence of FTR related to delays in activation of RRTs is increasing, leading to poor patient outcomes. Internal evidence showed RRT activation delays ranging from 3 to 12 hours of onset of deteriorating patient condition, and the greatest barrier identified was health care provider response. Subsequently, rather than activating the RRT, nurses have opted to consult the physician, unit nurse practitioner, or a nurse colleague for confirmation and affirmation of their assessment, thereby delaying care. **Method:** This study is a quasi-experimental pretest and posttest research design with a convenience sample of registered nurses and clinical partners who work in a community hospital. A 3-part RRT survey was used to assess knowledge of conditions prompting a code rescue; to identify barriers in initiating a code rescue, using a Likert scale; and to gather demographic information. Participants partook in a 30-minute simulation preceded by an educational training session that incorporated real clinical case scenarios to improve knowledge and skills related to clinical deterioration and initiation of code rescue. After simulation educational training, participants took a posttest survey. **Result:** Activation of code rescue within 30 minutes of reported signs or symptoms or identification of abnormal vital signs per code rescue criteria was the benchmark used to determine timely activation of a code rescue. Six months of data show that code rescue activation improved from 42% to 77%. Additionally, nurses feel more confident speaking about why they activated the code rescue. Ancillary staff have also reported the sense of feeling empowered to advocate for their patients. Additionally, nurse and physician communication has improved; there is a greater sense of cohesiveness in emergency situations. **Conclusion:** Improving nurse confidence and empowering staff to activate code rescue leads to a decrease in morbidity and mortality and length of stay, improved

overall patient outcomes, and increase in staff satisfaction, because staff feel their role as a health care provider improves patient outcomes.

RS12: Evaluating Early Mobility in Patients With Temporary Femoral Venous Dialysis Catheters (EARLY-WALCS)

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Purpose: To evaluate the effect of an early mobilization protocol for patients with femoral vascular access catheters in a cardiac intensive care unit (ICU). The primary aim is to assess the impact of early mobilization on safety. Secondary objectives include evaluation of the effect of early mobilization on ICU and hospital length of stay, the level of functioning achieved in the ICU, and assessing the Activity Measure for Post Acute Care scoring tool at the time of discharge. **Background/Significance:** Temporary, nontunneled femoral venous dialysis catheters (femoral vascaths) for continuous renal replacement therapy (CRRT) are a barrier to early mobility for patients in the adult ICU and can be associated with poor outcomes (eg, bleeding, catheter dislodgment, venous puncture). Early mobility reduces the risk of cognitive decline and the risk for physical disability after ICU discharge. However, few existing studies demonstrate that early mobilization of patients with femoral vascaths is safe and feasible. **Method:** This prospective 2-group comparison included all patients admitted to a 24-bed adult cardiac ICU with femoral vascaths. We compared standard care with implementation of a progressive mobility protocol for patients receiving CRRT who passed the safety screen portion of the standard early-mobility health system policy. The Early Mobility in Patients With Temporary Femoral Venous Dialysis Catheters (EARLY-WALCS) protocol was implemented, as follows: (1) Care team reviewed mobilization process with patient/family; (2) the registered nurse (RN), with the physical therapist or occupational therapist, assessed the site integrity; (3) the RN disconnected the patient from CRRT by recirculating saline within the circuit or discontinuing the treatment and returning the blood; and (4) mobilization proceeded in a stepwise fashion with hip flexion limited to not more than 45°. **Result:** Among all participants (n = 56), 28 received standard care and 28 received the progressive mobility protocol. The mean age was 60 (SD 15.4) years, and most were male (n = 43) and White (n = 41). There was no significant difference between groups with regard to demographic characteristics or the diagnoses represented, severity of illness, or number of comorbidities ($P = .33$). The ICU length of stay

was similar in both groups ($P = .12$), as was hospital length of stay ($P = .34$). No adverse events were reported in the ICU for the intervention group. **Conclusion:** Results of this study suggest that early mobilization of patients with femoral vascaths can be safely performed using a structured site assessment, clear communication to maintain site integrity and patency, and relatively liberal flexion limits. Future research may further explore hip flexion limits and longer-term outcomes such as total hospital length of stay.

RS13: Patients With Heart Failure and Dysphagia in the All of Us Cohort Are More Malnourished and Have Poorer Perceived Health

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Purpose: This analysis was conducted to compare overall health and malnutrition in patients with heart failure (HF) with and without dysphagia in a large cohort of patients enrolled in the All of Us Research Program. Analyzing dysphagia and outcome data in the All of Us cohort would provide a unique opportunity to understand health burden of patients living with HF in a broader context. **Background/Significance:** Patients with cardiac cachexia have a 2 to 3 times greater mortality rate than patients without cardiac cachexia. Dysphagia-malnutrition-cardiac cachexia is a vicious cycle that can affect the prognosis of patients with HF. Dysphagia can also increase the risk for aspiration pneumonia regardless of diagnosis. **Method:** This was a retrospective analysis of All of Us Research Program data on patients with HF with and without dysphagia. Patients' nutritional measurements include serum albumin level, body weight, and body mass index (BMI, calculated as weight in kilograms divided by height in meters squared). Patients' health perception was evaluated by the Overall Health Survey. The health variables of interest included general health, physical health, and mental health. These ordinal variables are rated as excellent, very good, good, fair, and poor. **Result:** Among 14 424 patients with HF, 2969 (20.5%) were diagnosed with dysphagia. The mean left ventricular ejection fraction was 45.74% for patients with dysphagia and 43.09% for patients without dysphagia ($P < .001$). When patients with dysphagia were compared with patients without dysphagia, significant differences were found in BMI (32.1 vs 32.8; $P < .001$), weight (89.3 vs 93.5 kg; $P < .001$) and serum albumin level (25.1 vs 28.8 g/dL; $P < .001$). Patients with dysphagia also reported significantly lower ratings for their general health (58% vs 50%; $P < .001$), quality of life (31% vs 28%; $P < .001$), physical health (58% vs 51%; $P < .001$), and mental health (23% vs 19%; $P < .001$) than patients without dysphagia reported. **Conclusion:** Patients with HF with dysphagia are

markedly malnourished and have poorer perceived health than patients without dysphagia. Additional research is needed to develop and test effective interventions to improve health outcomes for patients with HF and dysphagia.

RS14: Impact of a Recharge Room on the Perceived Stress Levels of Staff in an Intensive Care Unit

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Purpose: To determine if use of a multisensory recharge room affected self-reported and perceived stress levels of staff working in an intensive care unit (ICU). **Background/Significance:** According to a survey of 12 800 nurses by the American Nurses Foundation, 52% of ICU nurses reported that they are not emotionally healthy, and 30% wanted to quit. Nurses reported the intent to leave was related to the negative impact their jobs had on their well-being, staffing shortages, and little support from their hospital. Because of the low unit morale in the ICU, nursing leaders set into place a recharge room for staff to promote mental wellness by reducing stress levels at work. **Method:** Space in an ICU was converted to a multisensory recharge room where staff could recharge for 15 minutes during their shift. Aromatherapy, spa music, purple lighting, faux plants, and a massage chair were included. The room was funded by a donor. The study consisted of a 2-question survey using a 5-point Likert scale to evaluate the effectiveness of the room. The survey was completed anonymously by 107 staff during 4 weeks in the spring of 2022 and indicated staff stress levels before and after room use. Surveys were collected each week. After the 4-week period, a mean score was calculated for each question. The survey also included an optional section for qualitative feedback on user experience. **Result:** All 107 participants completed both questions. The mean self-reported stress level before entering the room was 3.9 out of 5. After using the recharge room, the mean self-reported stress level was 1.3 out of 5. Thus, the mean reduction in stress level was 66.7%. Of the 107 participants, 38 completed the optional section for qualitative feedback. Overall, the comments provided were positive. Some comments were as follows: "One of the best breaks I've ever taken!"; "So relaxing, really helped after 4 overnight shifts"; "The lemongrass scent and the music was nice. The orchid is beautiful. I feel so much better mentally after using the room"; and "I feel less anxious." **Conclusion:** The results of the study showed that the recharge room was effective for reducing stress of ICU staff. A limitation was the method used to report stress, as opposed to using more valid measures of stress or burnout. Future research can determine if the room

affects physiologic indicators of stress, such as heart rate. In this postpandemic time, interventions to address the mental health of staff are urgently needed. Recharge rooms may help with short-term stress and are an option to consider.

RS15: In-Theater eFAST Training: Critical Skill Set Acquisition and Maintenance

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Purpose: Extended Focused Assessment Using Sonography in Trauma (eFAST) is a critical skill set that can efficiently identify patients in need of immediate intervention (eg, tube thoracostomy, exploratory laparotomy). The objective of this quality improvement (QI) protocol was to evaluate the skill set acquisition, retention, and degradation of eFAST in a combat theater using ultrasound-naïve US military medics. **Background/Significance:** Recent advancements in ultrasound have led to new applications of point-of-care ultrasound. Combat theater presents numerous constraints on patient care. Point-of-care ultrasound, specifically eFAST, may further improve lifesaving capabilities of soldiers. The ability of medics to acquire and retain the eFAST skill set in a combat theater is unknown. **Method:** Ten US military medics stationed in a combat theater volunteered for this QI protocol. The QI protocol consisted of 3 phases: (1) skill set acquisition (a 4-hour hands-on course with an Objective Structured Clinical Examination [OSCE] and written examinations before and after training on day 1); (2) skill set maintenance (a proctored eFAST examination daily on days 2-29); and (3) skill set retention and evaluation (OSCE and written examination at 30, 60, and 90 days). No scheduled training occurred during phase 3. Phases were compared using an analysis of variance with post hoc analysis. Sonosite M-Turbo (Fujifilm Sonosite Inc) was used for all examinations. **Result:** In phase 1, mean scores differed significantly from before to after training on the written examination (46% vs 71%; $P < .001$) and for overall image interpretation (46% vs 68%; $P = .003$). Phase 3 did not show any significant difference at days 30, 60, and 90 in overall written examination scores (72%, 70%, and 70%, respectively; $P = .63$) or in overall image interpretation (70%, 71%, and 70%, respectively; $P = .66$). The OSCE scores evaluated on days 1, 30, 60, and 90 showed no significant change (93%, 98%, 99%, and 98%, respectively; $P = .33$), nor did overall window accuracy on those days (93%, 98%, 99%, and 98%; $P = .34$). In phase 3, the overall eFAST time decreased significantly (403 seconds to 86 seconds; $P < .001$). Nine of 10 medics completed day-60 evaluations, and 7 of 10 medics completed day-90

evaluations. **Conclusion:** eFAST can be taught and retained by US military medics in a combat theater. Daily proctored examinations for 30 days showed excellent retention with no significant degradation in written examination scores (70%-71%) or technical skills (93%-99% window of accuracy) at 90 days. More study should include participants from the Army Nurse Corps to address far-forward nursing care during Tactical Combat Casualty Care and Prolonged Field Care on the battlefield. Disclosure: Edward Jones is a consultant for Boston Scientific.

RS16: Intravenous Smart Pumps at the Point of Care: A Descriptive, Observational Study

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Purpose: To advance understanding of intravenous (IV) smart-pump primary and secondary fluid and medication administration practices using the Baxter Spectrum IQ. Specifically, we observed adherence with manufacturer IV smart-pump system setup requirements at the point of care during actual clinical use. Adherence to system setup requirements is necessary for accurate fluid flow. **Background/Significance:** Linear peristaltic IV smart pumps, such as the Baxter Spectrum IQ, are prone to use error because the setup process must be managed manually at the point of care. Failure to adhere to setup specifications during clinical use may lead to dangerous medication errors due to decreases in flow rate between what is actually delivered to the patient and what is programmed into the pump by the clinician. **Method:** The study was conducted in a 285-bed community hospital. The study design was observational and noninterventional, and all data were collected by a single observer. Observations included measurement and documentation of adherence to the Baxter Spectrum IQ system setup requirements with both primary and secondary infusion during actual use. We also collected information on the type of secondary medication, system components (ie, secondary hanger, tubing connections), concurrent flow, and incomplete delivery. **Result:** A total of 200 primary and secondary IV medication administration observations were included, 101 in a critical care unit and 99 in a medical-surgical unit. Overall adherence was 6.5% for IV smart-pump position relative to the patient (aim 1), 6.5% for required position of the primary infusion bag (aim 2), and 69.5% for required position of the secondary medication infusion bag (aim 3), with no single system completely correct. Additionally, 83% of secondary medications were antibiotics, and we found incorrect use of hanger (30%), concurrent flow (24%),

and incomplete delivery (61%). **Conclusion:** These results add to the body of knowledge that adherence to the required system setup for head-height dependent IV smart pumps is low and difficult to achieve during actual clinical use, resulting in notable reductions in flow rates and secondary medication delivery. Consideration of alternative human factors–designed technology to replace the current manual setup requirements is needed to improve the process of acute care IV medication administration in this very important area of patient safety.

Disclosures: Karen Giuliano has received research grants from ICU Medical, Ivenix, RF Health, and Philips Healthcare; and is a consultant for GE, Medtronic, RF Health, Stryker, and Atlas Lift Technology. Jeannine Blake is a Philips Healthcare Advisor, a consultant for ICU Medical, TagCarts, Recovery/Force, BioDerm, and ICCAC. Robert Butterfield is a consultant for Becton-Dickinson, Baxter Healthcare Corporation, ICU Medical, and Fresenius-Kabi.

RS17: Magnitude of End-of-Life Obstacles and Helpful Behaviors as Perceived by CAH Nurses

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Purpose: Critical access hospitals (CAHs) provide patient care to rural and hard-to-access populations in the United States. These CAHs often lack the resources of urban facilities and tend to have poorer outcomes and increased mortality rates. Researchers have published studies on obstacles and helpful behaviors from members of the American Association of Critical-Care Nurses primarily working in urban settings. However, there is a gap in the literature regarding perceptions of obstacles and helpful behaviors in end-of-life (EOL) care in rural areas serviced by CAHs. **Background/Significance:** Mortality rates in hospitals are reported to be as high as 33%. Critical care nurses care for dying patients daily, whether the patient is in an urban or rural setting. There are 1352 CAHs in the United States. Critical access hospitals serve approximately 55 million people in the United States. Understanding how obstacles and helpful behaviors in EOL care may be unique to CAHs and may play a role in the experiences of dying patients and their families, as perceived by nurses working in these rural hospitals, is essential. **Method:** After human-subject approval, a sample of 500 CAHs was randomly selected. Of those CAHs that cared for critically ill patients, 46 initially agreed to be included in the study. A 73-item questionnaire was sent to the nurses working in those CAHs who had cared for dying patients. The instrument was developed, reviewed by experts, and pilot tested before dissemination. We received 188

completed questionnaires. Quantitative data were analyzed. Frequency, measures of central tendency, and reliability statistics were calculated for all items. Additional calculations were made to determine magnitude scores (mean size × mean frequency). **Result:** The 3 obstacle items seen as having the highest impact on EOL care were families not understanding what the term “lifesaving measures” meant, the nurse being called away from the patient to help with a new admission, and family and friends who continually call the nurse for patient updates. The following 4 helpful-behavior items received the highest scores: allowing family members adequate time to be alone with the patient after death, providing a peaceful, dignified bedside scene for family members after death, teaching families how to interact with the dying patient, and having health care providers involved in the patient’s care agree about the direction of care. **Conclusion:** Nurses perceived family members as creating obstacles to providing EOL care. Additionally, demands on nurses’ time were also obstacles. The most helpful behaviors for EOL care in CAHs focused on 12 nurses creating positive experiences for families, families supporting nurses, and providers and families agreeing on care plans and prognoses. Visiting-hour policies seemed to be insignificant obstacles and the use of technology, such as telehealth, seemed to provide little benefit in EOL care in CAHs.

RS18: New Graduate Nurses’ Transfusion Training Views: Reflection on Experiences With Adverse Reactions

Hind Jaber-Daou; Virginia Commonwealth University, Richmond, VA

Purpose: The study explores the adequacy of knowledge and training specific to blood transfusions and emotional responses of new graduate nurses (NGNs) related to their experiences with transfusion reactions. The purpose of the study was to reflect on NGNs’ experiences of blood transfusion reactions, recognize emotional effects of these experiences, and explore the influences of training programs. **Background/Significance:** Unsatisfactory knowledge and inadequate training result in NGNs experiencing stress and lacking professional confidence. New graduate nurses’ knowledge about blood transfusions is critical to administer blood safely and recognize symptoms of adverse reactions. **Method:** A theoretical, qualitative, hermeneutic, phenomenological approach was adopted as the study design. Eligibility criteria were as follows: NGNs (ie, nurses within 1-3 years of graduation) who attended a blood transfusion training for newly hired nurses, who worked in clinical areas where blood products are transfused, and who witnessed a patient experiencing

a transfusion reaction. Sampling was purposeful, and 12 NGNs who met the inclusion criteria were interviewed. Data were collected using a semistructured, conversational style and digitally recorded interviews using narrative context questions, descriptive and structural questions, and imaginative variation. Data were analyzed using Colaizzi’s descriptive strategy. **Result:** Three thematic categories emerged from responses to research questions: emotional distress and burnout (the nurse felt they had failed the patient and voiced shame, worries, self-blame, and helplessness), second-victim phenomenon (eg, moral distress, conflict in duties contradictory to patient safety concerns), and unpreparedness and reality shock (due to minimal education in nursing schools and lacking hands-on practice administering blood during clinical training). Other themes emerged from participants’ statements, including competency validation (marking boxes on a checklist), training program structure (described as intense and not organized), and preceptorship issues (lack of full attention and support). **Conclusion:** The following actions and recommendations for future research to assess and evaluate efficacy are suggested for consideration: shifting from relying on academia to focusing on practice, collaboration between nursing schools and clinical areas to map teaching and practice and to use didactics and simulation, including transfusion education and hands-on practices in academic settings and clinicals, and establish a supportive culture to assist NGNs in transforming knowledge and skills into safe practices.

RS19: Nurses’ Perception of Telemedicine Adoption in the Intensive Care Unit

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Purpose: The success of telemedicine (TM) may be dependent on its being accepted by bedside nurses and providers. Prior work on perceptions of TM have been with single groups. This study was conducted to compare perceptions of TM technology between between nurses of 2 intensive care units (ICUs) concomitantly. One ICU is staffed primarily with nurses new to the ICU (ARICU). The other unit is staffed primarily with experienced nurses (CVICU). **Background/Significance:** Telemedicine is use of medical data exchanged electronically between 2 sites to improve patients’ status. Consultation is given in real time by off-site experts who observe for changes in patient trends and clinical deterioration. Studies evaluating nurses’ perceptions of TM have mixed results. Some felt it improved survival, prevented errors, augmented patient satisfaction, and decreased length of stay. Others felt it disrupted work flow and was intrusive

and an interference. **Method:** A descriptive correlational design was used. Perceptions of TM were compared among nurses of 2 ICUs. An 8-item, 5-point range TM-perception questionnaire was chosen. A content validity index (CVI) was calculated. A CVI of 1.0 was achieved, and all items were retained. Participants completed demographic and perception forms. Descriptive statistical tests were conducted for demographics and each aspect of nurses' perception of TM. We conducted *t* tests and χ^2 tests. Statistical analysis software was used for all analyses with a 5% significance level. **Result:** Sixty nurses participated (30 nurses per unit.) Years of TM experience ranged from 0 to 31 years (median, 1.25 years) and was significantly lower in the ARICU ($P = .02$). The TM perception scores ranged from 2.4 to 5.0 (mean [SD], 3.8 [0.6]). Mean perception scores were significantly higher in the ARICU ($P = .008$). The ARICU group had significantly higher scores for question 1 (TM improved patient outcomes) and question 4 (time spent communicating with TM is valuable). The ARICU group also had slightly higher scores on question 8 (TM staff is responsive to my patients' needs) and question 3 (TM and ICU physicians collaborate on our patients' care.) The correlation between ICU years of experience and mean TM perception scores was not significant. **Conclusion:** This study provides data about ICU nurses' perspectives of TM value. Nurses with minimal ICU experience valued TM support more than nurses with more experience valued it. Trust is often gradually built among individuals through face-to-face interactions. Experienced nurses have worked closely with providers and peers and may have built up trust based on challenging experiences. One area of future study may include incorporating pharmacy and procedural support, which may provide additional TM benefit.

RS20: Reaching Out: Extending Intravenous Pumps Outside COVID-19 Patient Rooms

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Purpose: To determine if using intravenous (IV) tubing extensions to place IV pumps outside of the rooms of patients with COVID-19 could decrease staff exposure and personal protective equipment (PPE) use. No research was available via the CINAHL and PubMed databases. No guidelines previously existed within our organization. Environmental obstacles, supplies needed, medication considerations, and risks to patients were considered to create safety guidelines. **Background/Significance:** The rapid spread of COVID-19 infections in 2020 led to concerns regarding staff safety and supply-chain

instability. Critically ill patients require frequent in-room visits. Input was collected from nursing, engineering staff, physicians, pharmacists, and infection control personnel to develop safety guidelines for using extension tubing. Lack of available evidence-based guidelines required us to create our own safe implementation. These guidelines were made available to all intensive care unit (ICU) nursing staff. **Method:** Patients with COVID-19 who had central venous catheters were considered for using extension tubing. Education was provided via team huddles, poster boards, and printed guidelines, which were hung on IV poles. The ICU sliding doors were engineered to allow IV tubing to be threaded through the entry. A data collection tool was developed for nursing staff to track and record each IV-pump interaction. The time taken to don and doff PPE was measured to calculate nursing time. The cost per unit of PPE was calculated to determine the supply costs. Data were collected on 58 patients who had external pumps during the 3-month data collection period. The institutional review board deemed this study not to be human subjects research. **Result:** A total of 1186 entries into the room were prevented by placing IV pumps outside of patients' rooms during the data collection period. On average, 20 sets of PPE were saved every data-collection day. The total cost savings in PPE was \$8848. The mean time saved from having to don and doff PPE was 3.3 nursing-hours per data-collection day. The mean number of entries saved per day was 20, thus reducing exposure time and preventing staff downtime and cost for paying staff to quarantine. No patients were adversely affected, and no nurses were infected with COVID-19 during the trial period. **Conclusion:** The use of extension tubing decreased exposure time for nursing staff and the amount of PPE used. Results showed overall financial savings for our unit. This project, developed by a multidisciplinary group, was successful in contributing to both staff and patient safety. It is possible that this procedure could be beneficial in decreasing staff exposure to other highly transmissible pathogens, although more research needs to be conducted to increase the generalizability of our findings.

RS21: Remote Intravenous Smart-Pump Use During COVID-19: Accuracy and Safety Concerns

Jeanne Blake, Karen Giuliano; University of Massachusetts, Amherst, MA

Purpose: To measure the flow-rate accuracy of 4 intravenous (IV) smart pumps (IVSPs) when set up using extension tubing to move IVSPs outside of patients' rooms. This practice began during the COVID-19 pandemic to decrease use of personal protective equipment (PPE), decrease risk to clinician

safety, and improve workflow. The safety of this practice has yet to be fully analyzed; this study evaluated flow-rate accuracy alterations and how patient safety was affected. **Background/Significance:** Given that approximately 90% of hospitalized patients require IV medications, the practice of moving IVSPs outside of patient rooms gained popularity. Despite emergency-use authorization for this practice, patient safety related to flow-rate inaccuracy and resultant medication dosing error appears not to have been evaluated until now. **Method:** This laboratory-based study measured flow-rate accuracy of 3 of the most used IVSPs in US acute care (namely, the BD Alaris, the Baxter Sigma, and the ICU Medical Plum models) along with 1 IVSP (Ivenix) newly approved by the US Food and Drug Administration. These methods presented no risk to patient safety while offering levels of experimental control that would be unachievable at the bedside. Various lengths and sizes of extension tubing were systematically tested at clinically relevant flow rates through each IVSP. All setup conditions met manufacturer recommendations to ensure isolation of the variable of interest. The outcome was percent flow-rate deviation, which represents the difference between actual flow rate and the programmed rate. **Result:** All IVSP models performed within the industry accepted variation of $\pm 5\%$ flow-rate accuracy during control testing, indicating each IVSP was accurate under expected conditions. The cassette-based IVSP models (ie, Ivenix and ICU Medical) experienced the least flow-rate deviation across all extension tubings tested. Only the Baxter Sigma IVSP permitted the flow of fluid through every tubing at all flow rates, resulting in a decreased flow-rate accuracy below the accepted $\pm 5\%$ level. All other IVSPs detected a downstream occlusion pressure that was too high to permit flow through at least 1 tubing tested. **Conclusion:** This study found that the use of extension tubing can put patients at risk of dosing error due to inaccurate flow. It is important to note that many other setup conditions are also known to affect flow and are likely to occur in combination when moving IVSPs outside of patient rooms. These include venous access device use, IVSP height, and IV bag height. The compounding effect of these conditions along with extension tubing use is likely to have important effects on accuracy and patient safety.

Disclosures: Jeannine Blake is an advisor for Philips Healthcare and a consultant for ICU Medical, Tag-Carts, Recovery/Force, BioDerm, and ICCAC. Karen Giuliano has received research grants from ICU Medical, Ivenix, RF Health, and Philips Healthcare and is a consultant for GE, Medtronic, RF Health, Stryker, and Atlas Lift TecÚology.

RS22: Results of a Patient-Family Assessment of Satisfaction in the Intensive Care Unit

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Purpose: Patient and family satisfaction is a key quality metric for health care organizations. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey is routinely used, yet this survey may not provide a comprehensive assessment of care in the intensive care unit (ICU). The purpose of this project is to evaluate baseline patient and family satisfaction in our cardiothoracic intensive care unit (CTICU) and identify strategies to enhance satisfaction for patients after cardiothoracic surgery. **Background/Significance:** Although HCAHPS survey results provide key feedback regarding patients' experience during their stay in the hospital, there is not specific focus on their time in the ICU. As a result, patient satisfaction in the ICU setting can be challenging to measure, monitor, and improve. Use of specific tools, such as the Nursing Intensive Care Satisfaction Scale (NICSS), to measure patient and family satisfaction during their ICU stay could help ICU teams enhance satisfaction of patients and their families. **Method:** A prospective, single-cohort study was conducted to ascertain the current state of patient and family satisfaction and identify gaps in quality of nursing-care delivery using the NICSS and the European Quality Questionnaire (EuroQ2). The nursing research team sequentially enrolled all patients admitted to the CTICU with a length of stay of less than 24 hours and less than 7 days and their family members and invited them to complete the satisfaction (NICSS) and quality (EuroQ2) surveys within 3 days of ICU transfer. Descriptive statistics were used to evaluate responses and identify opportunities for improvement. Analyses were conducted in SPSS Statistics (IBM Corp). **Result:** The mean age of the 47 patients enrolled was 62.9 (SD, 13.7; range, 18-86) years and 57% (n=27) were male. Patient satisfaction (NICSS) scores were high on each of 3 subscales: holistic care (mean, 144.55; SD, 27.15), communication modes (mean, 55.72; SD, 10.55), and professional behaviors (mean, 66.53; SD, 12.56). Family experiences as indicated by their EuroQ2 responses were also high for the 3 subscales. Quality of care provided to family members scored 9-10 for 89% of respondents (scale of 1-10, with 10 being highest); the lowest score was 7 (n=1; 3%). No difference was found between patients and family members (P=.06). Narrative results suggested opportunities to improve communication regarding expectations for transfer. **Conclusion:** This study characterizes

patient and family satisfaction with ICU care using validated surveys developed and codesigned with patients. Though overall satisfaction with care was exceptional across domains for both patients and families, opportunities to improve communication of expectations for time to transfer and further avoid sleep disturbances were identified. Future work will integrate patient and family input to design interventions to improve communication of expectations and sleep.

RS23: Role of Professional Staff Development and Compassion Fatigue Among Critical Care Nurses

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Purpose: To examine the role of professional staff development level (SDL) as it relates to compassion fatigue (CF) and compassion satisfaction (CS) among critical care nurses during the COVID-19 pandemic. Components of these include burnout and secondary traumatic stress (STS). **Background/Significance:** During the COVID-19 pandemic, critical care nurses were at increased risk for burnout and STS. Research indicates CF has serious consequences for nursing staff, patients, and health care organizations. Short staffing, high-acuity patients, and supply shortages during the pandemic were contributing factors to CF. To our knowledge, no studies have investigated nurses' CF in relation to SDLs during the COVID-19 pandemic. **Method:** This cross-sectional study included a convenience sample of 74 critical care nurses from a fully integrated, Magnet-designated health care system in the rural northwest. Surveys were distributed via email and poster QR codes for nurses to assess demographic variables, SDLs, and multiple predictors against outcomes, measured by the Professional Quality of Life Scale. Correlations and linear regression modeling were conducted to determine significant predictors of CF (ie, burnout and STS) and CS. **Result:** Of the 74 participants, 84% (n=62) were female, 90% (n=67) had a BSN degree and had been a nurse for a mean (SD) of 7.47 (9.19) years. Reported SDLs, from lowest to highest, were as follows: 11% (n=8) were novice, 23% (n=17) were advanced beginner, 18% (n=13) were competent, 15% (n=11) were proficient, and 34% (n=25) were expert. Having a BSN predicted an increase of 3.82 points in the burnout scale ($F_{1,72} = 5.91, P = .03$), and having a degree other than nursing predicted a -4.181 decrease in burnout ($F_{1,72} = 6.17; P = .02$). The competent SDL predicted an increase of 3.89 points on the STS scale ($F_{1,72} = 4.12; P = .05$). Overall, the findings indicate high levels of burnout and STS. **Conclusion:** The research team was pleased with the number of surveys returned. Learning during the pandemic was altered for the competent SDL and

the research team anticipated nurses at this level to exhibit the highest CF. This was demonstrated by the survey results. Opportunities were discovered to mitigate CF and promote CS within the staff development program before reaching the competent SDL. We anticipate a follow-up survey to measure the outcome of our interventions.

RS24: Use of a Novel Mechanical Compression Device in a Surgical Population: A Pre/Post Study Design

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Purpose: To compare the current standard of deep vein thrombosis prophylaxis using intermittent pneumatic compression (IPC) with a novel mechanical compression device (MCD) for compliance with wear time, clinical usability, patient-mobility activities, and patient satisfaction. **Background/Significance:** Deep vein thrombosis leading to pulmonary embolism represents the third most common cause of vascular mortality worldwide. Approximately 900 000 Americans have a venous thromboembolism (VTE) each year, resulting in up to 100 000 deaths. Nonadherence with IPC devices exists, and studies have found that patient refusal and discomfort, including interference with sleep; lack of patient education; and availability of equipment are the most-identified barriers. **Method:** During a 3-month period, convenience sampling was used to recruit patients and staff from adult inpatient surgical units, including 1 critical care, 1 progressive care, and 2 medical-surgical units. A pre/post study design was used for patient data; "pre" data on compliance and patient-mobility activity measurements were collected on the standard-of-care IPC (n = 45) and "post" data and measurements were collected for the MCD (n = 44). Staff (n=30 for IPC; n=33 for MCD) and patients (n=30 for IPC; n=30 for MCD) completed paper usability and satisfaction surveys developed by the study investigators for the IPC and MCD devices. **Result:** All analyses were done using an independent samples *t* test with significance set at $P < .05$. The MCD group had significantly longer wear times: day 2, 19.3 h/d versus 12.9 h/d in the IPC group ($P < .001$) and day 4, 17.6 h/d versus 12.8 h/d in the IPC group ($P = .006$). Compliance with the optimal wear time of at least 18 h/d was higher for patients in the MCD group (67.4%) than for patients in the IPC group (43.2%). No significant differences were found between the IPC and MCD groups for nursing staff clinical usability. The MCD group had significantly higher satisfaction with sleep and comfort than did the IPC group ($P = .04$). The MCD group reported significantly higher satisfaction with and support for meeting patient-mobility activity goals compared

with the IPC group ($P < .001$). **Conclusion:** When comparing the MCD with the IPC standard of care, results indicate the MCD was associated with improved wear time, design (tubeless and cordless), and patient satisfaction. On the basis of these initial findings, the usability of the device has already been improved, including future communication with the medical record. Additional implications include further reducing VTE complications and engaging our patients, families, and multidisciplinary teams in patient-mobility activities while reducing patient harm.

Disclosures: Carmen Davis is on the Sage/Stryker Speakers Bureau and is a consultant. Teresa Beeson is on the Sage/Stryker Speakers Bureau and is a consultant. Karen Giuliano has received research grants from ICU Medical, Ivenix, RF Health, and Philips Healthcare; and is a consultant for GE, Medtronic, RF Health, Stryker, and Atlas Lift Tecnología.