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DISTINCTION DAY

Abstract Book

Acknowledgments

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Health System Transformation & Leadership Distinction Track

Improving Transition from Pediatric to Adult Sickle Cell Care Using a Transition Checklist

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Affiliations: [1]ECU Brody School of Medicine, [2]ECU Health Pediatric Hematology/Oncology Department

Background: Sickle cell disease (SCD) is an inherited hematologic disorder that affects over 5,500 individuals in North Carolina[1]. The transition from pediatric to adult care is a vulnerable period for patients with SCD and is associated with increased Emergency Department utilization and hospitalization[2]. Many patients face challenges in developing autonomy for their healthcare, particularly in managing their condition independently. These challenges are compounded by gaps in health literacy, poor health behaviors, and socioeconomic barriers. To address these issues, our team implemented a standardized transition checklist in the ECU Health Pediatric Hematology/Oncology Clinic with the aim of improving patient preparedness and provider consistency in transition planning.

Aim Statement: By April 1, 2025, incorporate the transition checklist into the care of at least 60% of eligible patients (aged 12 and older with SCD) seen at any ECU Health Pediatric Sickle Cell Clinic visit.

Methods: The quality improvement initiative was conducted at ECU Health's Pediatric Hematology/Oncology Clinic, where monthly Sickle Cell Clinics are held. All patients aged 12 and older with SCD received a transition checklist at check-in. The checklist was divided into three phases of graduating competency focusing on health knowledge, health behaviors, and socioeconomic readiness. Nurses, providers, social workers, and child life specialists were responsible for assessing competencies during the clinic visit and documenting progress in the electronic medical record via a set dot phrase. A patient advanced to the next phase upon completion of at least 80% of the checklist.

Results: From October 17, 2024, to March 20, 2025, 54 eligible patients were seen across six clinic dates. The transition checklist was successfully incorporated into the medical record for 19 patients (35%). Among these, five returned for follow-up visits, and in each instance, checklist documentation was continued. Only two patients (11%) progressed to Phase II of the checklist by the end of the intervention period. Implementation varied significantly by clinic date, ranging from 0% to 78%. Notably, implementation success correlated with the specific providers present on a given clinic day.

Discussion: The transition checklist represents a valuable tool to support pediatric SCD patients as they prepare for adult care. It empowers patients by fostering autonomy, encouraging health literacy, and supporting self-advocacy. However, consistent implementation remains a challenge. The project met its aim of ≥60% implementation just two out of the six individual clinic days. Checklist use was highly variable and strongly linked to the clinical team's engagement. Only two patients advanced beyond Phase I, underscoring persistent gaps in transition readiness. These findings highlight the need for continued provider reeducation and system-level interventions to ensure sustainable use of the checklist. Next steps include collaboration with the transition coordinator, regular team meetings to reassess challenges to checklist usage, and exploration of barriers to patient progression through the checklist phases. Standardizing this process could ultimately improve outcomes for adolescents with SCD during the critical period of healthcare transition.

Implementation of a Hydrocortisone Discontinuation Protocol for Septic Shock in ICU Patients

Authors: Elizabeth Davidson, MPH; Brody School of Medicine at East Carolina University, Jennifer Stahl, MD; ECU Health/Brody School of Medicine at East Carolina University, Department of Internal Medicine, Tyler Chanas, PharmD; ECU Health, Department of Pharmacy, Critical Care Pharmacy

Introduction: Recommendations from the 2021 Surviving Sepsis Campaign Guidelines advocate for the use of intravenous (IV) corticosteroids as an adjunct therapy in adult patients with septic shock and ongoing vasopressor requirements, informed by numerous studies that largely agree benefits of IV corticosteroid therapy outweigh potential risks. However, these studies do not demonstrate a cohesive approach to discontinuing corticosteroids once no longer needed. Thus, prior to this intervention there was no standardized protocol for discontinuing steroids after use in septic shock in the cardiac intensive care unit (CICU) at ECU Health Medical Center (ECUHMC).

Aim Statement: By May 30, 2024, we will implement a standardized protocol for discontinuing hydrocortisone use in patients with septic shock in the CICU at ECUHMC. Within our population of patients meeting inclusion criteria, 80% will undergo our proposed discontinuation protocol.

Methods: 126 adult patients diagnosed with septic shock and treated in the CICU at ECUHMC with at least one vasopressor and hydrocortisone between June 2023 and April 2024 were included in the study. The protocol was communicated to medical providers and pharmacists staffing the unit and a series of plan-do-study-act (PDSA) cycles formed the basis of data collection and analysis regarding adherence to the proposed hydrocortisone discontinuation protocol.

Results: Following dissemination and initiation of the protocol, the percentage of patients adhering to the proposed protocol increased from 78% pre-protocol to 88% during the final PDSA cycle. 13 patients in total completed a hydrocortisone taper that was inconsistent with the protocol suggested by our team. Of these, over half were deviated from the protocol due to initiation of comfort care or chronic steroid use prior to admission.

Discussion: The implementation of a standardized protocol for discontinuation of hydrocortisone in adult patients with septic shock in the CICU at ECUHMC had rapid uptake, strong adherence among providers, and no identified systemic adverse effects. Further work is needed to promote uptake in other units at ECUHMC, examine outcomes associated with steroid use, and evaluate exceptions to the protocol.

Right Care at the Right Location: Retrospective Review

Author: Miles Farlow, LINC Scholar, M4, Brody School of Medicine, East Carolina University

Introduction: A significant percentage of patients expiring within 48 hours of transfer to ECU Health Medical Center (ECUHMC) are previously transferred from a community hospital. Notably, many such patients receive no specialty interventions at ECUHMC, indicating many of these transfers are not medically indicated and do not benefit patients. These transfers lead to higher costs incurred by ECUHMC and decreased ECUHMC ICU bed availability. Our ECU Health Tele-ICU consultation program hopes to ameliorate these issues. The program connects regional hospital providers in the ECU system with intensive care specialists at ECUHMC, allowing for discussion of intensive care and whether or not transfer ECUHMC is indicated. Current consultation rate for patients meeting inclusion criteria for Tele-ICU consultation is suboptimal, and many patients receiving consultation could receive it earlier in their stay.

Aim: To demonstrate benefit of Tele-ICU consultation to regional hospitals and patients by comparing ventilator length of stay for early consultation (less than 48 hours from admission), and late consultation (Post 48 hours after admission).

Methods: Retrospectively review patient charts to determine patients' ventilation durations after receiving Tele-ICU consult and trying to evaluate if we are having extended ventilator days due to late Tele-ICU consultations.

Results: Currently under analysis. Data to report includes primary diagnosis, hospital providing care, ventilation duration post-consult, average time meeting criteria for consult before consult occurs,

Discussion: Tele-ICU consultation likely decreases ventilation duration in regional ICU patients and often prevents transfer of such patients to ECUHMC. Decreased ventilation duration leads to decreased length-of-stay, increased ICU capacities across the region, increased revenue, and decreased adverse events. Increasing consultation rate for patients meeting inclusion criteria could optimize these benefits.

Conclusion: Tele-ICU utilization in the ECU Health system can lead to improved intensive care in the region and fewer unnecessary transfers from regional hospitals to ECUHMC, reducing costs of care and increasing ECUHMC ICU bed availability. Increasing consultation frequency is in the best interest of regional ICU patients, regional hospitals themselves, and the ECU Health system as a whole.

Tiny Thyroids: A Quality Improvement Project Screening for Thyroid Dysfunction in Iodine-Exposed Neonates

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Background: Thyroid hormone is crucial for neurocognitive development in infants, and excessive iodine exposure can suppress its production. There are many case reports of topical iodine exposure induced thyroid dysfunction, and we have seen several cases in our neonatal intensive care unit (ECUMC NICU). In March 2022, the U.S. Food and Drug Administration (FDA) recommended checking thyroid function tests within three weeks of intravascular iodinated contrast exposure for children under three years old. Per these guidelines, we designed a quality improvement (QI) project to achieve an 80% screening rate for thyroid dysfunction seven to ten days after iodine exposure within a 12-month period in ECUMC NICU.

Methods: Our multidisciplinary team designed a screening algorithm to identify thyroid dysfunction in neonates. We measured the percentage of patients screened for thyroid dysfunction after iodine exposure, the percentage of these patients who had their problem list updated correctly, and the number of patients who had more than three thyroid function screening tests without any intervention. Due to the sporadic nature of positive cases, we chose to group iodine-exposed infants in groups of five and tracked them through time. Our team completed four Plan-Do-Study-Act (PDSA) cycles to implement our screening algorithm from August 2022 to April 2024.

Results: We achieved a 71% thyroid lab screening rate for iodine-exposed infants, unable to meet our 80% goal. Twenty infants had abnormal thyroid labs and five were then started on levothyroxine to treat thyroid disorder. Three of these five patients did not survive due to severity of their illnesses.

Conclusion: Our QI team did not meet the 80% goal of screening for thyroid dysfunction after iodine exposure. We found the number of infants with abnormal thyroid levels requiring treatment was low, and this level of screening protocol was not clinically relevant. In April 2023, the FDA revised its guidelines to screen iodine-exposed children for thyroid dysfunction based on individual factors. Although rare, thyroid dysfunction can still occur, potentially having long-term effects on childhood development. Further clinical research is necessary to identify risk factors in infants especially premature infants for hypothyroidism to avoid over screening.

Improving Bone Density Screening Order Rates at the ECU Adult and Pediatric Health Care Clinic

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Introduction: Osteoporosis poses a major public health concern, with compromised bone strength and increased fracture risk leading to significant disease-associated morbidity and mortality (1). To screen for osteoporosis, the United States Preventative Services Task Force (USPSTF) recommends obtaining bone density measurement, most commonly via dual-energy x-ray absorptiometry (DXA) (2).

Aim Statement: In the ECU Med-Peds Clinic, we aim to screen 25% of female patients over the age of 65 for bone density who have never been screened before by January 31, 2024.

Methods: A patient-facing handout was created describing osteoporosis, screening for disease, and prompting patients to ask if they qualify for screening. This was distributed to patients during rooming, prior to their visit with a physician or other healthcare provider. Screening rate was calculated using orders placed in the electronic medical record (EMR) compared with total number of eligible patients.

Results: Pre-intervention screening rate was 25.3% (69/273) and completed order rate was 27.5% (19/69). Post-intervention screening rate was 23.3% (71/305) and completed order rate was 60.5% (43/71).

Discussion/Lessons Learned: Results from this study suggest that patient-facing communication may increase the number of completed screening orders for osteoporosis per USPSTF guidelines, although we were unable to observe a difference in ordered placed for bone density screening. Furthermore, results from this study are difficult to interpret as institutional changes occurred during the intervention, such as movement of DXA study results to the “Imaging” section of the EMR and lack of appropriate DXA screening prompting a “care gap” alert on the EMR.

Conclusion: Patient-facing communication may increase screening rates for osteoporosis, however further interventions should aim to address the number of ordered, but not completed, bone density studies.

Enhancing Chlamydia and Gonorrhea Screening Rates among Female Teens: A Pediatric Outpatient Clinic Initiative

Authors: David Oakley, LINC Scholar, M4, Brody School of Medicine, East Carolina University, Shaundreal Jamison, MD, MPH East Carolina University Brody School of Medicine, Department of Pediatrics

Background: This QI project aimed to increase Chlamydia/Gonorrhea (C/G) screening rates among female adolescents aged 15-18 attending the East Carolina University (ECU) Pediatrics outpatient clinic. National data indicates low screening rates among sexually active high school students, particularly for females. By improving screening rates, it is possible to enable earlier STI detection to prevent severe consequences associated with these infections in adolescents. Our Aim statement was to increase the rate of Chlamydia screening in female teens aged 15-18 in the ECU Peds outpatient clinic by 5% in twelve months

Methods: This employed the Plan-Do-Study-Act (PDSA) cycle to implement and evaluate interventions, including staff education and modifying well-child check templates to improve screening rates. After each intervention, data was collected on the rates of C/G screening. In the first cycle, resident physicians working at the clinic were sent educational material over e-mail, in their workroom, and at required lectures emphasizing the importance of screening. In the second cycle, residents were provided a template to add to their Well-child visits and physicals. There were two PDSA cycles performed.

Results: Only sexually active women aged 15-18 were included in this study. Furthermore, patients were included only if they were in the clinic for a physical or WCC; women here for acute visits or follow-up were not included. Prior to the intervention, the clinic had an 85% screening rate. After the first PDSA cycle, the rate remained stagnant at 85%. After the second PDSA cycle, the rate improved to 89%.

Conclusion: From our study, increasing C/G screening rates is best improved by providing tangible changes to the system rather than educative efforts. With that said, this study had a low overall sample size. Further studies would be indicated to better describe the generalized of the data.

Timely Extubation in Low-Birth Weight Preterm Infants Using a Standardized Protocol

Authors: Pankti Sheth, BS[1], Juan Guillen-Hernandez, MD[1-2], Dmitry Tumin, PhD[1], Christy Owens, RRT[2], Zachary Holton, RRT[2], Kelly Bear, DO[1-2]

Affiliations: [1]The Brody School of Medicine at East Carolina University, Greenville, NC, USA
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Introduction: Extubation protocols can improve patient outcomes by decreasing the duration of mechanical ventilation in the Neonatal Intensive Care Unit (NICU) thereby reducing long-term complications such as bronchopulmonary dysplasia (BPD). A multidisciplinary team evaluated and standardized the current standard of practice within the hospital and other institutions to create a protocol to determine extubation readiness.

Aim statement: Reduce the median time a preterm infant with birth gestational age less than 29 weeks and birth weight less than 1500 grams remains intubated in the NICU by three days over a span of nine months.

Methods: Parameters for extubation readiness include weight, mean airway pressure, FiO_2, pH, and $PaCO_2$. Outcome measures include total time of intubation and BPD incidence. Process measure includes time to first extubation attempt. Balancing measure is re-intubation rate within 48 hours of extubation trial. The median of the outcome measures, balancing measure, and Kaplan-Meier calculations for time to first extubation attempt are analyzed each month and plotted on a run chart. Baseline data was collected from March- October 2023. Before the protocol's implementation, the median total time intubated was 13.5 days and the goal was determined to be 10.5 days.

Results: PDSA cycle 1 in November 2023 implemented the protocol by creating a note. Cycles 2 and 3 clarified the PaCO2 parameters and ensured compliance. In cycle 4, a flowsheet added in EHR simplified data entry. A centerline shift or a consistent trend was not noted for the outcome, process, or balancing measures. Synergism and positive communication between team members was noted due to streamlining of the process.

Discussion: The trend's inconsistency and lack of a centerline shift since protocol implementation could be secondary to several factors. Multiple co-morbidities in our high-risk study population that require prolonged care and non-compliance with protocol can serve as confounding factors. In the future, NICU providers will continue collecting data to see the trend over a longer period. PDSA cycles to ensure compliance with the protocol have been implemented and QI initiatives to standardize the post-extubation respiratory support will be undertaken as well.

Conclusion: Protocol algorithms can be used in the NICU to determine extubation readiness by collecting data over an extended period while continuously improving the process.

Medical Education & Teaching Distinction Track

Spaced Digital Image Identification Enhances Performance on Medical Neuroanatomy Practical Examinations

Authors: K. Ryan Dickerson[1], Kori L. Brewer [1,2]

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Background: Practical examinations in anatomical sciences challenge medical students to precisely identify structures and apply higher-order reasoning under strict time constraints. This is particularly difficult in neuroanatomy, where structural complexity and subtle anatomical variation increase cognitive load. As digital education tools evolve, there is increased interest in using image-based, technology-driven strategies to enhance learning. This study evaluated the effect of a supplemental spaced-repetition digital flashcard deck on medical student performance during practical examinations in the 2022 Medical Neuroscience course at the Brody School of Medicine (BSOM) at East Carolina University.

Methods: A digital flashcard deck was developed using the ANKI platform and included a randomly selected subset of testable neuroanatomical structures. Each flashcard displayed an image for identification and incorporated optional spaced-repetition algorithms. After each course unit, students completed a digital practical exam and reported how they used the deck. Student performance was compared across three groups: those using the deck with spaced repetition (R), those without spaced repetition (NR), and those not using the deck (N). Two-tailed, two-sample t-tests were used to compare performance between groups.

Results: A total of 341 exam data points were analyzed across four neuroanatomy digital practical examinations. Across all four exams, no significant differences in total exam scores were observed between groups ($p > 0.20$). However, students in the R group scored significantly higher on flashcard-associated questions compared to non-users (mean 89.35 vs. 85.29; $p = 0.0076$), with the
largest effects in Exams 1 (mean 92.18 vs mean 84.00; $p = 0.0051$) and 2, and less consistent trends in Exams 3 and 4. Within-group comparisons showed improved performance on flashcard-associated versus non-associated questions in all groups. The R group demonstrated the greatest within-group gain (mean improvement = 9.34 points; $p < 0.001$), followed by NR (mean improvement = 7.10; $p < 0.001$) and N groups (mean improvement= 4.72; $p = 0.008$).

Conclusion: Students who used the spaced digital image identification tool outperformed peers on associated practical exam questions, with the strongest effects observed early in the course. The declining trend over time is likely multifactorial, influenced by non-randomized group assignments, shifting student engagement, and the digital format of assessments. While findings suggest spaced repetition enhances neuroanatomy learning, further study is needed to assess generalizability to cadaveric exams and the effect of user-driven content expansion.

Documentation of Child Abuse After Treatment of Pediatric Patients for Confirmed or Suspected Child Maltreatment

Authors: Courtney Elliott[1], Dmitry Tumin PhD [1]

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Background: Nonaccidental trauma (NAT) is a leading cause of mortality in children within the United States, causing nearly 2000 deaths per year. Patients who have experienced NAT and other forms of maltreatment are at a greater risk of developing chronic conditions in adulthood. Due to the potential for long-term sequelae of child maltreatment, it is important to recognize and monitor patients who are survivors of physical abuse and childhood trauma during their continuing care.

Methods: We queried records from pediatric and adult emergency departments, inpatient pediatric units, and outpatient pediatric clinics operated by the ECU Health system on its flagship campus in Greenville, North Carolina. The primary outcome was use of the code Z62.81 in each subsequent visit to ECU Health facilities' main campus. In a random 10% subsample of patients with no subsequent use of the Z62.81 code after the initial encounter, we manually reviewed the latest available note to determine if history of child maltreatment was captured in free-text documentation. Continuous variables were summarized using medians with interquartile ranges (IQR) while categorical data was recorded as counts with percentages. Bivariate comparisons of patient characteristics at the time of the index visit by any vs. no use of Z62.81 code at subsequent encounters were performed using rank-sum tests for continuous variables and Chi-square or Fisher's exact tests for categorical data.

Results: Only documentation of an ICD-10 code related to sexual abuse was associated with subsequent use of the Z62.81 code. Documentation of ICD-10 codes related to sexual abuse was present among 75% of patients with subsequent use of the Z62.81 code, compared to 36% of patients without subsequent use of this code (p=0.011). the bivariate analysis while stratifying the sample based on any subsequent use of T74 or T76 diagnosis codes. Only race and ethnicity were associated with this secondary outcome, with White patients being more likely to have T74 or T76 codes documented at subsequent encounters, compared to other groups (p=0.046).

Conclusion: The importance of intervention and documentation in medical care is imperative to combat this epidemic as child maltreatment immediately harms children but also has been shown to lead to increased incidence of chronic conditions later in life. The limited utilization of Z Codes may be improved by increasing understanding on the significant impact identifying and recording social determinants of health to improve patient outcomes and reduce the impact social determinants of health have on an individual.

Research Distinction Track

Demographic, Disease, and Treatment Characteristics of Primary Tracheal Cancers

Authors: Kristen Armel, MS[1], Taylor Stamey, MS[1], Joseph Maitre, BS[1], Andrew R. Cunningham, BS[1], Andrew W. Ju, MD[2], Aidan Burke, MD[2], James E. Speicher, MD[3], Musharraf Navaid, MD[4], Arjun Bhatt, MD[1], and Michael C. Larkins, MD[1],[5]

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Background. Primary tracheal cancers (PTCs) are rare neoplasms underreported in the literature. No consensus guidelines exist for the treatment of these cancers and multi- modal management of these cancers has not been adequately explored for cases diagnosed over the past 2 decades.

Methods. The Surveillance, Epidemiology, and End Results (SEER) database was queried to identify patients with PTC. Cox proportional hazards and log-rank testing was used to assess the association between demographic and treatment variables and 5-year cause-specific survival (CSS).

Results. Among the 689 identified patients, age < 65 years at diagnosis (hazard ratio [HR] 0.64, $p < 0.001$), non-squamous cell carcinoma (SCC) histology (HR 0.22, $p < 0.001$), and treatment with surgery (HR 0.43, $p < 0.001$) were all associated with increased 5-year CSS. Regarding disease histology, patients with adenoid cystic carcinomas (ACCs) had increased 5-year CSS compared with those with neither SCC nor ACC histology and those with SCC histology (83.4% [76.0%, 90.8%] versus 50.3% [42.5%, 58.1%] and 28.8% [23.2%, 34.4%]; $p < 0.001$) based on univariate analysis. Despite the improved CSS associated with surgery, 55% of the identified cohort did not undergo surgery, with only 5.5% of these patients having ACC compared with 58% having SCC ($p < 0.001$).

Conclusions. Age < 65 years, ACC histology, and treatment with surgery were associated with improved 5-year CSS among patients with PTC, although the significant proportion of this group not receiving surgery represents an opportunity for improved outcomes.

Re-Evaluating the Safety and Efficacy of Universal Post-Operative Admission in Tonsillectomies in Children Under the Age of Three

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Background: Adenotonsillectomy (T&A) is a common outpatient procedure for children, yet its necessity for inpatient observation in children aged 2-3 years is debated. This study evaluates complications and readmissions post-T&A in this age group at a single-center outpatient SurgiCenter.

Methods: A retrospective cohort study was conducted, identifying 410 patients aged 2-3 years who underwent T&A between October 1, 2018, and May 31, 2023. Patients were identified using CPT codes, and data on complications and unscheduled readmissions were collected. Complications were categorized and analyzed. Additionally, a PRISMA-style literature review was performed to compare findings with existing studies on T&A in children.

Results: Of the 410 patients, 7.32% experienced complications postoperatively. The most common complications were dehydration or poor oral intake (3.41%) and fever/viral/bacterial infections (3.17%). The mean time to complication presentation was 4.83 days (SD ± 3.20). Six patients (1.46%) required readmission, primarily for additional medical intervention (4 cases) and observation (2 cases). Complications necessitating intervention were low (5.12%), typically requiring brief treatments such as intravenous fluids or medication adjustments.

Conclusion: This study suggests that routine inpatient observation for children aged 2-3 years post-T&A may not be necessary in the absence of other risk factors, as complications requiring significant intervention are not increased in the outpatient setting for this age-group. These findings challenge the current guidelines for inpatient management for this age group and support a growing body of newer literature supporting outpatient management for this age group under specific conditions. Further research may solidify criteria for safe outpatient discharge, optimizing healthcare resource utilization and patient outcomes.

A Novel Opioid/Pramipexole Combination Treatment for the Management of Acute Pain: A Pilot Study

Authors: Cara Girardi[1], Joseph Duronio[1], Ryan Patton[1], Kevin O'Brien[2], Stefan Clemens[3], Kori Brewer[4]

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Purpose: Despite their dangerous side effects, opioid drugs remain a standard of care for moderate to severe pain with few alternatives. Strategies to maintain the analgesic effects of opioids while minimizing the associated risks are needed. Pre-clinical studies have shown using a dopamine 3 receptor (D3R) agonist as an adjuvant to morphine provides superior analgesia against painful stimuli compared to morphine alone. Our objective was to test if adjunct treatment with a D3R agonist can lead to a reduction in opioid use while maintaining effective analgesia.

Patients and methods: This study was set up as a double-blinded, placebo-controlled randomized trial. Enrollment included acute renal colic patients presenting to the emergency department, from which patients were randomized to either the "control" or "study arm". The control group received standard treatment of care (morphine, 0.1 mg/kg; i.v.) and an oral placebo pill. The experimental group received half-dosed morphine and oral pramipexole pill (0.25 mg). Pain measurements including a numerical pain scale and visual analog scale were collected from enrollees at baseline and every subsequent 15 min.

Results: A total of 19 patients completed the study, 10 in the experimental arm and 9 in the control arm. During the study period, effective analgesia (50% decrease from baseline) was achieved in 80% of patients in the experimental arm vs. 33.3% in the control arm.

Conclusion: Our pilot clinical trial demonstrated that D3R recruitment can serve as an effective adjuvant to low-dose morphine for control of renal colic pain and potentially other acute pain conditions.

Identifying Cell Adhesion Defects in Keratinocytes Expressing TP63 Mutations Linked to Ectodermal Dysplasias

Authors: Shirley P. Parraga[1], Maddison N. Salois[1], Jessica A. Gugger[1], Saiphone Webb[1], Christina E. Sheldon[1], Peter J. Koch[1], Maranke I. Koster[1]

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Abstract:
Ankyloblepharon-ectodermal defects-cleft lip/palate (AEC) and Ectrodactyly-ectodermal clefting syndrome (EEC) are ectodermal dysplasias characterized by a series of developmental abnormalities involving the skin, sweat glands, and nails, as well as other ectodermally-derived tissues. They are caused by mutations in the transcription factor TP63, which has been shown to be a master-regulator of epidermal development. One of the most severe clinical symptoms is the presence of skin erosions caused by severe skin fragility. This can lead to multiple clinical issues including lack of skin barrier function, skin blistering, and painful wounds. Our previous research has demonstrated abnormalities in the structure and function of desmosomes in AEC patients. We propose that cell adhesion defects also occur in EEC patients. To test this hypothesis, we used lentiviral constructs expressing AEC and EEC TP63 mutations in keratinocytes in order to study the effects within the context of the cell adhesion system. We will determine the expression and localization of adhesion proteins in these cells using western blotting and immunofluorescence techniques. We also expect to observe cell adhesion defects in the EEC mutations, which will be tested using a dispase functional assay. This research will further our understanding of the pathological process underlying ectodermal dysplasias, which is an important first step to design new treatment options for these devastating diseases.

Comparing prehospital time among pediatric poisoning patients in rural and urban settings

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Abstract:
Barriers to healthcare in rural areas can delay treatment in pediatric patients who experienced poisoning. We compared emergency medical services (EMS) response times and EMS-reported delays in responding to pediatric poisoning incidents between EMS agencies in rural and urban settings using the 2021 National Emergency Medical Services Information System (NEMSIS). Rural areas were defined as any location with a <50,000 population that is not part of a metropolitan area, and all other locations were classified as urban (metropolitan) areas. Patients under 18 years of age transported by EMS with a provider primary impression of poisoning were included (N=11,911, 12% rural). The median total prehospital time by EMS was 40 minutes (interquartile range: 29, 57, and the most common type of delay was scene delay (6%). On multivariable quantile regression, patients transported by rural EMS agencies experienced 7 minutes (95% confidence interval: 5, 8) longer prehospital time compared to those transported by urban agencies. On multivariable logistic regression, there were no differences between rural and urban EMS agencies in the occurrence of dispatch delay, response delay, scene delay, and transportation delay. These results also elucidate the need for a more equitable allocation of resources and training to better prepare EMS responders who serve rural areas. By integrating targeted interventions to rural pediatric populations, better care can be achieved for children across all geographic regions. Further research must be conducted to ascertain the specific factors, outside of delays, resulting in the disparity between rural and urban prehospital time.

Heart Rate Variability in Paramedics

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Background: Paramedicine is considered a high stress profession. Heart rate variability (HRV) has not been adequately studied in paramedics as in other health professions. HRV can be used to measure stress regarding sympathetic and parasympathetic nervous system interaction. This study aims to determine what aspects of on-shift duties are most stressful to paramedics.

Methods: This prospective observational study monitored HRV of paramedics for 5-7 hours each. Participants completed a pre-study questionnaire with demographic information and perceived stress levels. A 2-lead continuous heart rate monitor was placed and participants were observed conducting their normal daily routines, downtime and on calls. Each potential stressful event (SE) was marked to correspond to HRV metrics, including heart rate and low-frequency-to-high-frequency ratio (LF/HF). An LF/HF ratio of greater than 1.6 is suggested to be indicative of moderate to high stress. Proposed SEs were grouped by patient contact, administrative activity, driving, reporting, procedures, and dispatch for comparison to routine daily tasks.

Results: Eighteen participants were evaluated for HRV metrics. An independent-samples Kurskal-Wallis test compared differences for each SE to the entire cohort. There was a significant difference (SD) between routine activities and patient contact ($z= -6.602$, $p < 0.001$, adjusted $p = .000$), driving ($z= -3.366$, $p < 0.001$, adjusted $p = .016$), administrative activity ($z= -5.811$, $p < 0.001$, adjusted $p = .000$), procedures ($z = -6.382$, $p < 0.001$, adjusted $p = .000$), reporting ($z= -3.872$, $p < 0.001$, adjusted $p = .002$), and dispatch ($z= -8.374$, $p < 0.001$, adjusted $p = .000$). Reporting, procedures, and dispatch exhibited the most variation in LF/HF ratio. In comparison to the entire cohort median of 2.40, patient contact, administrative activity, driving, giving report, performing procedures, and dispatch were 2.95, 3.10, 3.10, 3.55, 3.60, 4.00, respectively.

Conclusion: The results suggest that interactions with dispatch were most stressful for paramedics, while patient contact was least stressful. Limitations were a small sample size, one local EMS system, and inability to control personal intake of HRV modulators. Further research should be conducted assessing other HRV variables and monitoring pre- and post-shift.

Predictors and Outcomes of Mental Health Conditions Among Patients with Colorectal Cancer

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Background: Patients with cancer experience significant psychosocial distress. As colorectal cancer (CRC) is the third most common cancer in the United States, mental illness has the potential to have a substantial impact on outcomes due to the unique challenges these patients encounter. The primary aim of the present study was to investigate predictors of new-onset mental health (MH) conditions after a diagnosis of CRC and determine the association of new MH conditions on survival.

Methods: A single institution, retrospective study was conducted. A multivariable Fine-Gray competing risks model was used to describe the primary study outcome of new MH diagnosis in patients at least 18 years of age with CRC. Survival was modeled using Cox proportional hazards regression with a time-varying covariate for new MH diagnosis.

Results: 456 patients were identified for inclusion, with 16% developing a new MH condition and 29% dying during follow-up. A new MH condition was more likely among non-Hispanic white patients compared to non-Hispanic black and were less likely among those who are male or had a pre-cancer MH condition. The onset of a new MH condition was associated with a threefold decrease in survival. In addition, having a pre-cancer MH condition decreased survival nearly twofold.

Conclusion: Our findings emphasize the importance of new-onset MH in patients after CRC diagnosis. Standardized screenings may alleviate some of the MH burden that patients with CRC experience, in addition to potentially improving the overall health of patients. MH conditions may impact not only CRC outcomes but may direct future studies analyzing the risks of new-onset MH conditions in other types of cancers, further expanding the importance of psychiatric support in patients with cancer.

Service-Learning Distinction Track

Implementing a Caregiver Support Group for Children with Intellectual or Developmental Disability

Authors: Spencer Cooke; Christine Jackson, RN; Allison Lemon, MD

What: Children with intellectual disability and/or medically complex care needs require physical, medical, social, educational, and emotional support in order to thrive. While there are various professionals both in the health and education realms that are trained to support these individuals, often times most of the responsibility falls on caregivers in order to make it all happen. This responsibility often adds significant emotional, social, financial, and educational challenges that can be difficult to manage both in the short and long term. There is an inadequate number of formal support systems that are available for caregivers such as these.

So What: This was the reason for the creation of the Caregiver Support Group at RHA-Howell Tar River in Greenville, NC. The goal of this group is to provide educational, emotional, and social support for caregivers of individuals with intellectual disability or medically complex care needs. The first meeting, *What to Expect if Your Child Goes to the Hospital*, was led by Dr. Caitlin King from ECU Health. This first meeting covered the process of getting admitted to the hospital followed by common tips, tricks, and pitfalls of the process. There were not any in-person attendees at the first meeting and technical difficulties with the online platform kept the virtual option from happening. We were expecting individuals to join the virtual option for the meeting and we could tell that the meeting and RSVP links had been utilized aptly.

Now What: Future meetings will aim to minimize the technical barriers that made this portion of the meeting inaccessible to the virtual participants. The first meeting will be rescheduled to provide this information to participants. Future meetings will occur every two months and surveys will be administered after meetings for caregivers to rate their experiences, suggest future meeting topics, and recommend areas for improvement. Additionally, RHA-Howell Center staff have generated future discussion topics that might be helpful for caregivers. These meeting topics include CAP-C, the concept of a “bed hold,” and community resources. Hopefully, this Caregiver Support Group will further perpetuate the utilization of support groups and provide a low-cost and inclusive way to support caregivers of this population.

Introducing Elementary Students to Medicine Through Physiocamp

Author: Micah A. Furr, Brody School of Medicine, East Carolina University

Background: Students in rural North Carolina often lack opportunities for early exposure to health education and science enrichment. Introducing basic health and anatomy concepts in an engaging, hands-on format may foster early interest in science and health care careers. Physiocamp is student-led initiative designed to introduce students in an after-school program to sports medicine and health topics through interactive, age-appropriate activities. The goal of this project is to inspire curiosity about human physiology and health care professions by using creative, experiential teaching methods.

Methods: In the 2024 school year, Physiocamp was conducted at Wahl-Coates Elementary School in Greenville, North Carolina, with 15 to 20 students attending each 90-minute session. Lesson plans were developed to cover key health topics including bones, joints, cardiovascular and pulmonary systems, nutrition, and injury prevention. Activities included model-based learning, creative exercises such as Play-Doh modeling, and opportunities to observe real human organs. Student understanding and engagement were assessed through informal questioning, hands-on activity participation, and group discussions.

Results: Students demonstrated increased engagement and understanding in the importance of nutrition for our bone health, major components of the skeletal system, heart and lung function and the differences between healthy and diseased organs. Student enthusiasm was highest during sessions that incorporated interactive elements such as Play-Doh skeleton construction and examination of real heart and lung specimens. These activities stimulated curiosity, encouraged discussion, and promoted retention of these concepts. All students participated fully in the sessions offered.

Conclusion: Interactive learning experiences like those offered through Physiocamp are effective for teaching basic health and physiology to elementary school students. Hands-on activities enhanced engagement and understanding, making science both fun and accessible for both students and those teaching these subjects. This approach may be especially beneficial in underserved areas where early exposure to health care careers is limited. While formal pre- and post-assessment data is hard to obtain in this setting, observations suggest a positive impact on student interest and comprehension. Expanding programs like Physiocamp may help foster a more diverse and inspired future health care workforce.

Feeding The Greenville Food Bank: Improving Volunteer Outreach and Recruitment

Author: Hoon Kong

Affiliations: Brody School of Medicine, East Carolina University

What? The Food Bank of Central and Eastern North Carolina provides meals for the needy and combats hunger and food insecurity in local communities throughout the state. The organization serves 34 counties, and the Greenville branch is responsible for 5 of these counties: Pitt, Lenoir, Greene, Edgecombe, and Wilson. Throughout 2024, the Greenville branch distributed over 12 million meals and over 8 million pounds of produce through volunteer activities and participation in federal and local nutrition programs. The Commodity Supplemental Food Program (CSFP) is a federal nutrition program that provides monthly food packages to individuals ages 60 and older who experience food and/or financial insecurity. The Greenville Food Bank is an active participant in this program, responsible for organizing and distributing over 12,000 food boxes monthly.

So What? Food insecurity, especially among the elderly population, has become a pressing concern within North Carolina due to the rapid growth of the adult population over recent years. The Greenville Food Bank's participation in CSFP, SNAP, and other food assistance programs are critical to providing healthy and nutritious food to needy and underserved communities throughout the state. The Food Bank is unable to effectively participate in these programs and perform its daily operations without the active engagement and participation of volunteers. The Food Bank has been actively involved in volunteer outreach and recruitment events throughout the community, including the annual Junior League Volunteer Expo. However, the need for improvement and expansion in their current volunteer outreach and recruitment methods has been identified as a critical one due to the Food Bank's heavy reliance on volunteer participation.

Now What? I created a new trifold poster along with other materials, including flyers and business cards, for the Food Bank in their participation in the annual Junior League Volunteer Expo, an event that provides non-profit organizations with the opportunity to recruit new volunteers, develop potential donors, and educate the public about the work of the organization. I also participated in the Food Bank's monthly edition of Volunteer Spotlight, speaking about my involvement with the CSFP program and the importance of volunteering on MLK Day. These efforts are part of a new initiative to expand and improve volunteer outreach and recruitment. The initiative will also incorporate innovative ways to engage new volunteers and maintain active participation within the current volunteer community. Some of these ways include assessing volunteer motivation through qualitative surveys, helping volunteers advance their own personal goals through new volunteer events and programs, and promoting social interactions and networking opportunities to enhance connections within the local community.

"HANDS-On Health Education" – A PhysioCamp Initiative for Early Childhood Healthy Lifestyle Development

Author: Micah Lee, Brody School of Medicine, East Carolina University

Across major disciplines of study, evidence suggests that fostering learning at a young age is crucial to developing attitudes and skill sets that are positive towards a given field. Moreover, evidence has shown that scientific discovery and hands-on learning have a positive impact towards future development of individual interest for science and pursuit of science-related fields. Therefore, as a part of the Service-Learning Distinction Track at Brody School of Medicine, several scholars have worked towards developing and maintaining a program that would allow K-12 students to experience ongoing medical education opportunities through creating fun learning opportunities and events. This project serves to highlight an expanding K-6th grade initiative of the program, "HANDS-On Health Education," showing how this focus has created new learning opportunities for students and has demonstrated an increased interest in science programming for these students.

The Brody School of Medicine Chapter of PhysioCamp has proudly served eastern North Carolina to promote medical science learning opportunities for K-12th grade students. This chapter has been active since 2018, founded by Brody student Holly Pittard Ingram who began PhysioCamp in 2014. As part of this project, a need was seen to foster and develop a strong K-6th grade program, with an emphasis on hands-on learning. Therefore, the project "Hands-On Health Education: PhysioCamp K-6th Grade Emphasis" was initiated, "Hosting" new target events, "Adapting" curriculum for target audiences, "Nurturing" positive relationships, "Discovering" new volunteers, and "Seeking" opportunities to expand in the rural Eastern North Carolina community.

This initiative has led to an expansion of PhysioCamp in younger audiences. As part of this emphasis, more curriculum was developed for the younger participants of PhysioCamp. New partnerships were established with Bethel Youth Camp, Falcon Youth Camp, Operation Sunshine, and The Boys and Girls Club. Additionally, a healthy lifestyles curriculum was implemented with physical activity and nutrition components.

To obtain measurable data for the initiative, participants were given a pre-test and post-test questionnaire to gauge both subject knowledge for the day's lesson and general questions about attitudes towards science. A "Learning Ruler" scale of "1 – Least knowledge/interest" to "10 – Most knowledge/interest" was offered to students. Qualitative data was collected in the form of verbal and written comments by participants and facility leaders. Improvements were seen in the major data categories collected, including factual knowledge (7.25 pre-test; 9 post-test) and love for science (7.75 pre-test; 9.6 post-test). Lifestyle choice data remained constant (10 pre-test; 10 post-test). Given the data collected, students demonstrated increased knowledge in the subject areas taught, and an increase in overall interest and desire to pursue further medical science programming.

No-Fuss Food: Easy Cooking for All:" A 20 Ingredient, 20 Meal, Word-Free Cookbook

Author: Dana Shefet, Brody School of Medicine, East Carolina University

Background: Food insecurity continues to affect thousands across North Carolina, including approximately 1 in 9 individuals before the COVID-19 pandemic—a number that has since increased. In Pitt County and similar low-income communities, challenges are compounded by the fact that roughly 15% of adults have below basic literacy skills, limiting their access to health information and economic stability. Compounding this, many individuals also face barriers such as limited access to reliable transportation, clean water, electricity, and stable housing—basic necessities that support safe, consistent meal preparation. These challenges increase reliance on fast food and pre-made meals, contributing to both financial strain and poor nutrition. To address this, our project aims to create a wordless, pictorial cookbook using 20 low-cost ingredients that can feed a family of four. The aim is to provide an accessible, educational tool tailored for low-literacy, low-resource households to support healthy, budget-friendly cooking.

Methods: Recipes were designed using 20 budget-friendly pantry staples and conveyed entirely through illustrations to accommodate limited literacy. Feedback on ingredients and recipes were gathered through interactions with patients at ECU Health to improve usability, clarity and ingredient familiarity. Although the plan is to distribute the cookbook via QR codes at clinics, this method assumes a baseline level of digital literacy and access to mobile devices with internet connectivity—resources not guaranteed in all target households.

Results: The cookbook utilizes 20 ingredients, totaling at less than $45 at Walmart as of April 2025 and creates 20 easy to recreate recipes. Suggestions for improvements or additional recipes were used to revise the cookbook. The final cookbook included changes following adaptations in realistic patient cooking habits.

Conclusions: This project targets the intersection of food insecurity and low literacy through an innovative, non-text-based intervention. While the cookbook fills an unmet educational gap, its real-world impact may be constrained by broader systemic barriers like housing instability and digital inequity. Recognizing these limitations is critical as we aim to create equitable, sustainable solutions for improving nutrition in underserved communities.

Medical Respite: Shelter for Medically Fragile People Experiencing Homelessness

Authors: Taylor Stamey, Kristen Armel, Janet Moye, David Collier, MD, Brody School of Medicine, East Carolina University

What: In January 2024, the Community Crossroads Center, the homeless shelter located in Greenville, NC, reopened its respite services. A medical respite, as defined by the National Health Care for the Homeless Council, is "acute and post-acute care for persons experiencing homelessness who are too ill or frail to recover from a physical illness or injury on the streets but are not ill enough to be in a hospital".

So What: An average of 20 medically fragile people experiencing homelessness utilize the Community Crossroad Center respite services on a monthly basis. Medical respites have been shown to allow for more timely hospital discharge and reduced emergency department recidivism[2]. There is less data, however, to show the effect medical respites have on the health of the people who utilize them. We plan to evaluate both healthcare costs saved, as well as the respite's effects on the health of people experiencing homelessness.

Now What: Average length of stay and the number of times a person returned to the emergency department for people experiencing homelessness who utilized the respite will be compared between before and after the respite's reopening in order to calculate healthcare costs saved for the ECU health system. Additionally, patient reported outcome measures (PROMs) will be compared between people experiencing homelessness who utilize the respite and the general population in order to gauge whether the respite is benefitting the health of the people it serves. The NC Albert Schweitzer continuation grant will be used to further furnish the respite.

Peer-Led Medical Spanish Education: Effects on Interprofessional Student Functional Language Self-Efficacy

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Background: Spanish-speaking communities continue to be medically underserved despite their rapid growth within the United States population. There is an increasing need for Spanish interpretation and dialectical proficiency across the healthcare system. Studies have shown that patient-provider language concordance is associated with improved patient experience, satisfaction, and outcomes for this population, demonstrating that clinicians can play a positive role in addressing this issue by improving their Spanish skills. This analysis examines the impact of peer-led medical Spanish modules designed for improving communication among interprofessional health sciences students and limited-English proficiency, Spanish-speaking patients.

Methods: An eleven-module curriculum was designed and implemented using Spanish educational toolkits and supplemented with lived experiences by the authors and their institution's chapter of the Latino Medical Student Association (LMSA). Each module focused on a different component of the patient encounter. This interprofessional curriculum hosted learners from various programs including allopathic medicine, physician associate, and nursing. Using a modified seven-point Likert scale, learners were asked to reflect on their ability to perform specific functional language tasks from 'very poor' (1) to 'exceptional' (7) before and after each of eight learning modules after introductory modules 1-3.

Results: On average, four learners were present across the eight surveyed sessions (n=38). Learners reported that their baseline Spanish ability ranged from 'beginner' to 'advanced.' 100% of learners (n=38) demonstrated improved self-efficacy following the modules. Six of eight surveyed sessions showed a significant change in average learner self-efficacy ($p<0.05$) from before to after the sessions.

Conclusion: Peer-led modules could be a beneficial educational tool for Spanish learners in the professional school setting. The increase in patient-provider language concordance from peer-led instruction could improve experience, satisfaction, and clinical outcomes for Spanish-speaking patients in accordance with the current literature. Retrospectively, sessions with the greatest mean change in self-efficacy from pre-intervention to post-intervention had flipped classroom activities focused on patient-provider role playing scenarios, oral interpretation practice, and structured group discussion around problem solving in patient-provider-interpreter encounters. Future renditions of the curriculum should focus on these activities.

Disclaimer: This project was granted exemption status by Human Subjects Institutional Review Board (HSIRB) of East Carolina University.