

EAST CAROLINA UNIVERSITY



August 2020

23RD ANNUAL
MEDICAL STUDENT
SCHOLARSHIP FORUM
Abstract Book

Acknowledgments

The Brody School of Medicine Summer Scholars Research and Distinction Track Programs would like to express sincere gratitude to the following individuals and participating faculty of the following departments for their support of the 2020 Program. Those listed provided financial support for student stipends, research resources, and/or administrative support for the 2020 Summer Immersion and Medical Student Scholarship Forum virtual celebration. These generous contributions make it possible for BSOM students to learn and make their own contributions to the field of medicine through scholarly pursuits.

Rosemary B. Allen Summer Scholars Research Fund

Dr. Davis Allen III, BSOM Class of 2006

Nitin Gupta Research Endowment

Dr. Nitin and Mrs. Mousami Gupta

John and Ann Laliotes LINC Scholars Endowment

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Program Directors: Timothy Reeder, MD and Suzanne Lazorick, MD

Health Care in Bethel, North Carolina

Gary Allen, Grant O'Brien

Brody School of Medicine

Abstract

Background: The social determinants of health have a substantial impact on health outcomes of patients and populations. The Centers for Disease Control and Prevention defines five categories of social determinants, including education level, economic stability, built environment, social cohesion, and health care.¹ Rural communities of North Carolina (NC) typically have less health care infrastructure and lower rates of health insurance relative to urban areas.^{2,3} Bethel, NC is a rural town of 1,611 people in Pitt County, and health care in Bethel has not been systematically evaluated.⁴

Purpose: To use experiential methods and available public data to evaluate health care in Bethel, North Carolina.

Methods: First, demographic data was obtained via internet search of the town, and health statistics were obtained from the NC Department of Health and Human Services⁵. Then, the authors performed a physical tour of the town on Tuesday June 30, 2020. Of note, NC was under Phase 2 COVID-19 restrictions under Executive order 141 of the governor at the time.⁶ Lastly, the authors interviewed Gloristine Brown, current Mayor of Bethel and resident of the town for over 20 years.

Results and Observations: Bethel contains two health care facilities: one dentist office and one pharmacy. Two primary care offices, including a federally qualified health center, are located within 11 miles. Greenville, NC is located 14 miles to the South and is home to Vidant Medical Center as well as various Vidant Health and ECU Physicians practices. Mayor Brown recalls a primary care practice closing in the town in 2012. 10.6% of households did not have a vehicle, and 17.6% of people were uninsured.

Conclusions

- Bethel has two local health care facilities that provide prescription medications and dental care. Significant medical resources are available in nearby Greenville, NC.
- Bethel has no in-town primary care clinics, and a significant percentage of citizens are uninsured. Also many citizens do not have access to a vehicle.
- ECU Physicians and Vidant Health can improve the health care of Bethel by providing part-time primary care coverage to the community or providing funding for transportation to primary care services.

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Title: The Assessment of Social Determinants of Health in Williamston, North Carolina

Authors: Mona Amin

Author affiliations: LINC Scholars Program, Brody School of Medicine

Abstract: Social Determinants of Health (SDOH) are the conditions in which an individual is born or raised and include factors like socioeconomic status, education, employment, geographical location, support systems, and more. SDOH are becoming increasingly prevalent in the evaluation of a patient. According to the CDC, physicians and communities can improve individual/population health and advance health equity through understanding the SDOH of their patients. This project will explore SDOH with a focus on housing in Williamston, North Carolina. Through this experiential immersion, I traveled to the town of Williamston to explore affordable housing units and related public health factors. For the formative part of this project, background research was conducted to determine which buildings to visit. The findings were documented through photography and an interview with the Director of Communications at Martin Community College. After visiting the town, I supplemented my findings with research from an affordable housing database and other resources. Some identified strengths include access to a newly built transportation system in Williamston and ease of access to resources for spiritual health such as churches. Issues that could pose as challenges to Williamston residents include accessibility to health services and surrounding grocery stores. An individual's home environment and access to resources are important factors in the holistic view of a patient; therefore, recommendations for Vidant and ECU include expansion of home health services and investment in accessibility to nutritious foods for the town of Williamston.

Analysis of Employment as a Social Determinant of Health in Grimesland, N.C.

Authors: Anna Lisa Ciarrocca, Atif Mahmood

Affiliations: LINC Scholars Program, Brody School of Medicine

Abstract

Rationale: Social determinants of health influence variations in health outcomes seen across geographical areas.

Purpose: This experiential study was conducted to investigate how social determinants of health impact the Town of Grimesland, NC. The social determinant of employment was specifically targeted.

Methods: Research was conducted to gain information about demographic characteristics of the Town of Grimesland. A visit to Grimesland was planned to investigate social determinants of health in the community. Observations were recorded through photographs and notes taken while touring Grimesland. Additional research was conducted to supplement observations made during the in-person visit.

Results and Observations: Grimesland is a rural town in Pitt County with a total population of 483. The median age of the population is 54.1 years. Due to the aging population of Grimesland, 49.5% of the population aged 16 and older is not in the labor force. There are 178 employed citizens in Grimesland and the average commute time to work is 35.3 minutes. The industries employing the largest percentage of the working force of Grimesland are retail trade, manufacturing, and educational services, health care, and social assistance. Due to the nature of the occupations of Grimesland residents, the average annual household income in 2018 was \$38,125, with 66.9% of the population having an annual household income less than \$50,000.

Conclusions: The Town of Grimesland prides itself on its sense of community and small-town charm. The nature of industries of employment and the high prevalence of an aging population out of the work force impacts the income and resources available for Grimesland households. Healthcare is not easily accessible for residents of Grimesland due to the absence of any medical clinic in its vicinity. The low average household income coupled with the geographical location of Grimesland creates a barrier to healthcare. Recommendations for ECU physicians would be to establish a local clinic in Grimesland to allow healthcare to be more readily accessible. In addition, due to the number of elderly citizens in Grimesland out of the workforce, educational programs geared toward chronic conditions and preventive medicine would also be beneficial.

Title: Windshield Tour: Social Determinants of Health and the Town of Tarboro

Author: Kiane Douglas, LINC Scholar – Brody School of Medicine

Abstract

Background – Social determinants of health (SDH) are the everyday activities and environment that have an impact on an individual’s health. The windshield tour project was carried out to allow observation of Tarboro’s SDH and the role it plays in the health care system. We observed several SDH, however, focused on the therapeutic mechanism that can exist for an environment that maintains spiritual health.

Purpose – We observed the number of churches and the social connection that coexists which allow for better health outcomes and the opportunity for the health system to make a positive change to smaller communities facing barriers to health care.

Methods – We researched information such as demographics and gathered a list of churches, food resources, and health centers to visit in Tarboro. Drove to Tarboro to conduct the windshield tour. Observed the town and discussed how the places visited tied into social determinants of health. With the observed information, we analyzed the positives and negatives of the SDH observed.

Results and Observations – Tarboro is located in Edgecombe county with a population of 10,715 residents and a median income of \$32,532 per household. There is one main hospital which provides some access to care. The environment provides green area for exercise allowing for fitness options. However, healthy food options were limited. The town also has 47 churches and no non-Christian churches were found. The variety of churches provides a positive SDH as churches assist with food access such as meals on wheels, as well as allows the health community to reach out to the local and marginalized residents through community and religious leaders.

Conclusions - The successes and challenges of SDH make up the characteristics of the town. This windshield tour highlighted the SDH like churches in Tarboro, which presents an opportunity to address issues found between the health system and communities. The health system can work with churches to increase health education and access to health care options to residents through health workshops at the local churches.

Childcare and Social Determinants of Health in Grifton: A Windshield Tour of Life in a Small Community in Eastern North Carolina

Emily Downs
LINC Scholar
Brody School of Medicine

Background: Social determinants of health are key in evaluating the needs of communities and designing interventions to improve health.¹ Rural communities typically have poorer health outcomes than other areas, much of which is tied to differences in these social determinants, including access to education, recreation, and healthcare.² Windshield/walking tours allow for real-time observation of conditions impacting health.¹

Purpose: Grifton, NC is a small town in southern Pitt County with a population of 2,516.³ We examined childcare as a particularly important social determinant, understanding that early childhood development has long-term impacts on social, cognitive, emotional, and physical development.⁴ Beyond the social interaction and opportunity for early education, the availability of childcare impacts the ability of a parent to work outside the home, thus having close ties to socioeconomic status and poverty, all important social determinants of health.⁴

Methods: We planned our visit by researching demographics online and utilized Google Maps to research businesses and locations to visit. We then visited on a weekday afternoon and began at Town Hall, where we were able to talk informally with two community members to gain additional perspective on childcare, physical activity opportunities, and general community culture. We then took pictures as we walked and drove around the community.

Results and Observations: Grifton's only formal daycare center, grocery store, and pharmacy have recently closed permanently, though there is a local pediatrics practice in operation. Despite the lack of businesses, community organizations and citizens have opened up a small daycare in a church, businesses and nonprofits offer after-school and summer programs for children, a local church ministry provides free meals, and there are many parks that offer safe outdoor recreation.

Conclusions: Strong community ties and support have mediated access to important services (e.g. childcare, enrichment programs, safe spaces for kids to play). Despite this, lack of formal daycare may limit early education opportunities, especially for low-income children, and transportation is of major concern. ECU and Vidant should recognize and partner with churches, nonprofits, and community events to promote healthy practices, invest in early educational opportunities, daycares, parks and green spaces, and public transportation systems.

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Brandon Garcia

Title: Social determinants of health: impact of education on Williamston, NC

Affiliations: LINC Scholars Program, Brody School of Medicine

Abstract:

A lack of medical services is thought to be the main reason for poor health, but, in reality, medical services play a small role in overall health. Health is highly influenced by nonmedical factors, such as social, economic, and environmental factors. These factors are often grouped together as social determinants of health, which create conditions that usually impact the wellbeing of a person such as housing, education, transportation, employment, food access, and more. This project's goal was to determine the importance and impact of social determinants of health on the town Williamston, NC. Specifically, the project focused on education, taking into consideration the location and condition of the schools, the performance of the schools, and the opportunities given to the community. Before the exploration, background research was done on the town to gain familiarity and a list of locations to visit. The findings were based on observation, photography, and in-depth research of the school system. Additionally, an interview with the Director of Communications/Public Information Officer of the Martin County Community College, Judy Jennette, was conducted to gain an inside perspective of the importance of the education system to the community. The town's strengths include the opportunity to obtain higher education and employment through the community college. The challenges include the necessity of a car, the low performing schools, and the limited job market. Overall, education is very important in terms of health as it influences job opportunities, income, and psychological skills; therefore, recommendations for Vidant and ECU physicians to help the community include sponsoring the school to help increase resources to help with education, such as the availability of internships for students, and improving healthy food options for the students.

Atif Sheikh Mahmood
Medical Student Scholarship Forum

Title: Health Indicators of Grimesland, NC: Transportation

Authors: Atif Mahmood, Anna Lisa Ciarrocca

Affiliations: LINC Scholars Program, Brody School of Medicine

Abstract:

The small town of Grimesland, NC is located roughly 12 miles east of Greenville. With a total area of around 0.5 square miles, Grimesland is home to under 500 people. While its tight-knit community takes pride in its small-town atmosphere and secluded location, Grimesland falls victim to many of the public health issues that plague Eastern NC. As part of a population health project for the LINC Scholars Program, we conducted an experiential “Windshield Tour” of Grimesland to observe its resources and ambience with respect to various health indicators, placing an emphasis on transportation. We found that the town’s main roads and walkways, situated adjacent to NC Highway 33, are relatively well-kept. Further, while most households own an average of 2 cars, nearly 10% of the population does not have a vehicle. For those who do, their average commute time is around 35 minutes. For those who do not, the Pitt Area Transit System (PATS) supplies on-demand transportation to Grimesland’s residents. However, with its inconvenient costs and hours of operation, PATS may not suffice in providing access to employment, healthy food, healthcare, or other resources. Especially considering the lack of any healthcare facilities within a 10-mile radius of Grimesland, we encourage Vidant and ECU Physicians to consider expanding into the area or working with PATS and other services to ensure more consistent, reliable, and accessible transportation to the town’s aging population.

Race and health disparities in small towns like Bethel, NC: “You’d have to be blind not to see it”

Grant O’Brien

LINC Scholars, Brody School of Medicine

Background/Rationale

In this exercise, we sought to immerse ourselves in nearby town Bethel, NC to better understand the sociological factors that influence the health of its 1,611 citizens. Bethel is a racially diverse community; 58% of its residents are black and 40% are white. Because race and ethnicity are strongly associated with health outcomes in the U.S., we examined racial differences in local factors like school performance, residence location, and home value and considered how these may contribute to health disparities.

Methods

We began with an exploratory walking and driving tour. Mayor Gloristine Brown graciously accepted our interview request; her perspectives regarding Bethel citizens’ health and her vision for the future were enlightening. A census map of residential segregation in America¹ and the NC School Report Cards provided valuable data.

Results and Observations

The residential segregation by race was striking to see on the Census map. Railroad tracks almost perfectly segregate Bethel’s black and white households. The values of the homes differ significantly; Mayor Brown pointed out that “you would have to be blind not to see it.” She described racially charged incidents she has dealt with as Bethel’s first black mayor, but also identified community initiatives that effectively include citizens of all backgrounds.

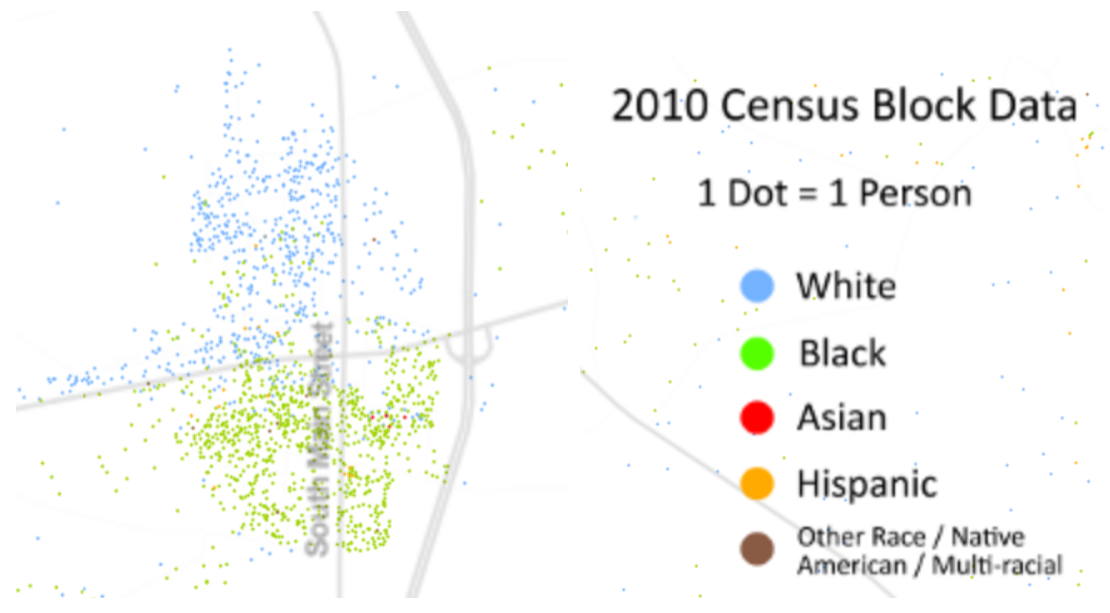
Racial residential segregation is a fundamental driver of racial disparities in health²; one suggested mechanism is varied educational quality and opportunity. Interestingly, although all children in Bethel are zoned to the same public school, they experience different outcomes on standardized testing: black students at Bethel Elementary received a performance grade score of 37, while their white counterparts scored 76. However, the school has exceeded predicted score for both subgroups (black = 86.0, white = 85.5).

Conclusions

Racial disparities in physical and mental health represent a vital challenge for health systems leaders to tackle in both rural and urban areas. Because race is inextricably linked to factors like housing and education, collaboration with local leaders like mayors and principals is essential for health systems. Organizations like Vidant have good reason to work to advance health equity and the resources to make an impact in their communities.

¹ Cable, Dustin: [The Racial Dot Map: One Dot Per Person for the Entire U.S.](#)

² Williams, D. R., & Collins, C. (2001). [Racial residential segregation: A fundamental cause of racial disparities in health](#). *Public Health Reports*, 116(5), 404-416. doi:10.1016/s0033-3549(04)50068-7



Nonye Onokalah

LINC Scholars Program, 2020 Summer Immersion Windshield Tour

Abstract

BACKGROUND: Grifton, North Carolina is located along the southern border of Pitt County. The town contains a population of 2,863 (46.1% male and 53.9% female), median age of 46.5, and the following racial composition: 50.9% White, 41.1% Black/African American, and 8.9% Hispanic/Latino.

PURPOSE: The purpose of the 2020 Windshield Tour was to explore social determinants of health for rural towns in Pitt County. These determinants included physical activity, childcare, healthcare access, nutrition, education, employment, social support, and housing.

METHODS: The goal of this project was to research, explore and evaluate Grifton social determinants of health, focusing on physical activity and childcare. Preparation required advanced research (on population demographic statistics and a compiled list of relevant locations to visit upon arrival), a trip to Grifton, and a subsequent presentation of findings. Both team members contributed equal effort toward research, data collection, and presentation preparation. Data consisted of photographs, a brochure obtained from Town Hall, and anecdotal information from an interview with Town Hall employees.

RESULTS: Arrival in Grifton revealed discrepancies between resources listed online and resources currently open and available to town residents. For example, the major childcare center listed online (Lil Tots Nursery and Preschool) was no longer in operation. Additionally, the only adult healthcare clinic (Physicians East) had been temporarily closed since March 2020. New Beginnings Church operates the town's one childcare center, but many residents must utilize out-of-town facilities for childcare as well as adult health care. No formalized indoor fitness center was located within the town, but there were a few parks with available facilities for outdoor physical activity.

CONCLUSIONS: A recommendation for entities providing healthcare to Grifton residents would be encouragement for cognizant realization of absent indoor fitness options, which poses a considerable barrier to physical activity. While Saint David Street Park offers a quarter-mile walking trail, patients would require multiple laps to complete at least one mile. Options for indoor physical activity could be enhanced by partnerships between employers and fitness centers, as subsidized gym memberships could decrease barriers and promote physical activity.

Food and Nutrition Accessibility in Tarboro, North Carolina

William M. Taylor

Brody School of Medicine

The goal of this project was to explore social determinants of health that adversely affect a particular town in eastern North Carolina. Our group was assigned the town of Tarboro, NC, which is about 45 minutes north of Greenville in southern Edgecombe County. They have a population of 10,715 with 48.8% of the populace being Black or African American, 44.9% being White, and 6.9% Hispanic. One of the main strengths of Tarboro is its health care access. Vidant Edgecombe gives the town access to emergency care and many physician offices are set up near the hospital. Economics was another key social determinant affecting the town. They have an unemployment rate of 13.5% and a median household income of \$32,532, which is only about 3/5 the median household income of North Carolina (\$52,413). Perhaps the biggest economical impact on the town is the 12.5% of households with no vehicle access, one of the highest rates in the region. With no reliable public transportation system in the town and the high number of people without a vehicle, it makes it difficult for the populace to obtain proper nutrition. The town only has one Walmart to the south-west, several Dollar Generals, Family Dollars and Dollar Trees, 2 Food Lions, a Piggly Wiggly, as well as about 40 chain and local restaurants. There is also a big problem with food pantry access in Tarboro. All of the food pantries listed in the local area are located outside of town, and only one church in the area was found to be part of a Meals on Wheels program. Overall, the town would benefit not only from a public transit system, but more grocery stores in the lesser income areas of the town so that residents could have access to fresh fruits and vegetables. Getting more churches involved in the Meals on Wheels program could also provide access to healthier meals for lower income families.

Medical Education & Teaching Distinction Track

Program Director: Luan Lawson, MD

Evaluation of Neuroscience Video Presentations to Improve Medical Student Learning

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¹ECU Brody School of Medicine, ²ECU Brody School of Medicine, Department of Emergency Medicine, ³ECU Brody School of Medicine, Department of Anatomy and Cell Biology

Abstract

This prospective observational study will evaluate the ability of pre-recorded video presentations of neuroscience laboratory material to improve student learning. Neuroanatomy has proven to be a topic that invokes fear among students that may lead to an impaired understanding of this critical information. This issue may be a growing concern for medical students and educators due to the novel Coronavirus (COVID-19), which has led to a transition of many medical courses to an online format. The combination of the inherently complex nature of the neuroscience curriculum with sudden virtual transitions is concerning due to the increasing burden of neurological disorders globally. These concerns necessitate a greater understanding of the effectiveness of online learning tools as a means of building a solid neuroanatomy foundation. A library of videos will be created based on each neuroscience laboratory dissection and made available to first-year medical students one week before the scheduled lab. The videos will highlight the steps of each dissection with an emphasis on locating important neuroanatomical structures of the brain and spinal cord. Knowledge assessments will be administered immediately prior to and again immediately after each in-person lab session. To determine if the videos effectively conveyed the necessary knowledge, comparisons of mean pre-test scores will be compared across students who viewed the videos prior to lab vs. students who did not. Additionally, pre-test vs. post-test scores for all students will be compared to determine if the lab itself conveyed the desired content. Finally, post-test scores will be compared between students who watched the videos vs. students who did not to determine if the videos provided additional benefit over the in-person session alone. At the end of the course, students will be asked to provide feedback about the videos through a voluntary questionnaire. The results of this study may support the use of additional online resources to accompany traditional neuroscience educational tools in the first-year medical curriculum. The study will also define the benefit of these tools for students who may be faced with the added challenge of online neuroscience medical education in the future.

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Effectiveness of Medical Play in Decreasing Stress and Anxiety in the Siblings of N.I.C.U.

Patients

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Abstract

This study will investigate the effectiveness of medical play in decreasing the anxiety and stress experienced by the younger siblings of N.I.C.U. patients throughout their stay in the Ronald McDonald House. It has been found that prolonged exposure to toxic stress in children can cause long term alterations to their brain circuitry resulting in a lower threshold for stress and permanent increases in body cortisol levels (CDC, 2008). As a result of these consequences, medical professionals have begun to seek means of preventing young children from experiencing these “medical traumas” (NCTSN, 2014). While the benefits of medical play in decreasing children’s stress levels have been documented for children in the inpatient setting, few studies have been tailored toward the siblings and families of these patients. Therefore, studies on the effectiveness of medical play in decreasing the stress and anxiety experienced by the healthy siblings of ill patients are necessary (Dinleyici & Şahin Dağlı, 2018). In this study, the Ronald McDonald House in Greenville, North Carolina will be outfitted with a medical play area that will allow participants to be led through predetermined medical play scenarios. The children will be asked to complete pre- and post-play questionnaires that will be an abbreviated version of the State-Trait Anxiety Inventory for Children (STAIC). The questionnaire will evaluate the children’s current level of anxiety and their propensity toward becoming anxious both before and after completing the medical play scenario. A group x time interaction will then be calculated using the data to determine the success of the medical play interventions in lowering the child’s stress and anxiety. Ultimately, the hope is to find that medical play can decrease the stress and anxiety experienced by the healthy siblings of N.I.C.U. patients and diminish the negative consequences of these stressful experiences on their lives.

Keywords: Medical Play, Childhood Anxiety, N.I.C.U.

Footnotes:

1. Medical Student Brody School of Medicine at East Carolina University
2. Neonatologist, ECU Physicians at Vidant Health, Greenville NC

Resources:

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Title: A comparative study between in-person and virtual delivery of a medical case study to second-year medical students

Authors: Kari Beasley, MPH, MS, Luan Lawson, MD, James Coleman, PhD

Acknowledgements: Thank you to Brody School for Medicine Medical Education and Teaching Distinction Track

Abstract

Across the United States, educational institutions have closed or moved to virtual solutions to combat the Covid-19 pandemic. The replacement of in-person classes with online classes may create a loss of collaborative experience for medical students (Ferrel & Ryan, 2020). The quality of the audio, video and presentation platform influence the effectiveness of the learning process (Atreya & Acharya, 2020). Content material is updated and formatted into virtual activities for medical students; however, the evaluation of the outcomes from this transition is yet to be determined (Rose, 2020). The purpose of this research project is to compare knowledge gained from virtual delivery versus in-person delivery of a physician case study to second-year medical students. Pre- and post- content quizzes, a resilience questionnaire and survey of the learning environment will be conducted to a convenience sample of participants. It is important to understand if the transition to an online medical education prevents proficiency of clinical training before medical students enter clerkships. Therefore, research to evaluate the efficacy of a virtual curriculum will benefit medical students impacted by the Covid-19 transition to online classes and in the future, the patients and community served by the student doctor.

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Student Response to Providing Review Materials in an Anki Flashcard Format

Brady B. Buchanan, William H. Archie, Philip Boyer

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Pathology content is a critical component of the first two years of medical school and comprises between 45-52% of discipline-specific content on Step 1 of the United States Medical Licensing Examination (USMLE) (1). Discussion among Brody School of Medicine (BSOM) students following completion of Step 1 revealed that many were unhappy with the depth and breadth of the popular commercial resources for pathology content. Likewise, while students were provided with comprehensive PowerPoint files for use during the pathology course to review and reinforce important concepts and content, students considered the format unwieldy in a continuous study routine before their USMLE examination date and chose to not use a potentially valuable resource. Anki is a popular flashcard software used widely by medical students (2) that provides an easy way to incorporate active recall and spaced repetition into studying, both of which have been identified as critical to studying in medical school (3). We hypothesized that providing in-depth review material from the medical school curriculum in an Anki flashcard format would facilitate student studies facilitate success for both course and the USMLE exams. In this pilot study the review PowerPoint files already used in the BSOM curriculum will be converted into Anki flashcards and provided alongside the PowerPoint files to approximately 75 second-year medical students in the pathology course. Each student will have the opportunity to participate in a survey after the completion of that section of the course and after the USMLE exam. These surveys will gather data on which resources the students used, as well as their preferences and motivations for their choice of resources. The surveys will also gather self-reported performance data and perceptions on how the review materials helped their studies. Performance and preferences will be analyzed to see if there is a significant difference between the use of PowerPoint files and Anki flashcards in ultimate performance on course and the USMLE exam.

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Title: Preparing Future Physicians for Treating Children with Autism Spectrum Disorder

Authors: Kelly Kimble

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Body of Abstract

Previous research has indicated a gap in the knowledge of medical students and residents regarding the characteristics and treatment of children with autism spectrum disorder (ASD) (Austriaco et al., 2019). A lack of training left many medical students and residents feeling uncomfortable and unprepared to treat this patient population (Austriaco et al., 2019). Due to this gap, the current research project will implement the CDC's Autism Case Training (ACT) program among clinical medical students and pediatric residents. Since the rate of children with autism spectrum disorder continues to increase, it is imperative that future physicians have the knowledge necessary to adequately identify the characteristics and treatment of ASD.

Clinical medical students and pediatric residents at East Carolina University will be invited to participate in this study. Subjects will complete an initial survey to assess their comfort level and self-perceived knowledge about ASD and complete a pretest to score their knowledge before the ACT program. The study will use the Knowledge about Childhood Autism among Health Workers (KCAHW) questionnaire to assess subjects' knowledge about the characteristics and treatment of ASD (Bakare et al., 2008). Subjects will then complete three cases from the online ACT program. After completing the online modules, subjects will complete an exit survey and a posttest, which assess the same topics as the initial survey and pretest. Correlation analyses will assess the relationships between performance on the pretest and posttest and level of comfort before and after the modules. This project has the potential to better prepare future physicians to identify and treat children with autism spectrum disorder and lay the foundation for long-term educational interventions in medical education.

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Examining the role of three-dimensional models in medical student understanding of high-yield embryology topics

Regan Lane, MS2, Brody School of Medicine

Abstract

Embryology is an essential component of medical curriculum that often challenges students due to abundant new terminology, transient structures, and dynamic processes occurring during fetal development. Medical students report difficulty visualizing these processes when delivered in the traditional lecture format and have indicated a need for high-quality visual aids in embryology courses (Cassidy, 2016). Previous research demonstrates that three-dimensional models are an effective study tool that increase assessment scores and resonate positively with students (Chekrouni et al., 2020; Estevez et al., 2012; Preece et al., 2013). This study will investigate the use of models to reinforce certain topics in embryology, namely neural tube formation and congenital heart defects. We will conduct an interactive study group where students can interact with three-dimensional models and receive peer instruction. Outcomes will be assessed using a multiple choice pre-session and post-session quiz of the topic covered, as well as a questionnaire to evaluate student opinions of the teaching method used. The goal of this study is to improve medical student understanding of these high-yield topics that not only are covered on board exams, but that future physicians are also likely to encounter in the clinical space.

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Using Exam Wrappers to Improve Metacognition in Preclinical Medical Students

Daniel L. Middleton

Abstract

Idea: To implement the use of Exam Wrappers¹ in order to enhance the learning value of formative assessments for both foundational science knowledge and metacognitive skills in preclinical medical students.

Rationale: One of the challenges for students in the preclinical years is to build effective learning goals to address their strengths and weaknesses based on formative quizzes. Furthermore, metacognitive skills such as self-assessment and self-monitoring although critical for physicians are often poorly developed in medical students. Having a systematic way to self-evaluate performance on assessments answers both of these problems by providing a framework to build learning goals and giving students the opportunity to regularly exercise metacognitive skills.

Methods: Participants from a cohort of first-year medical students will be asked to complete an Exam Wrapper during the normal secure review process for each formative quiz. These forms will be available to participating students after taking the quiz and will be filled out with pen or pencil and returned prior to leaving the secure review so that the responses can be recorded and evaluated. Lastly, each participant will have a unique pin so that they can retrieve a copy of the form for their own use.

Evaluation Plan: The Modified Motivated Strategies for Learning Questionnaire² will be used to track changes in metacognitive behaviors in participants by administering it in a pretest-posttest fashion at the beginning and end of the curricular block in which the study is conducted. Furthermore, content analysis of the Exam Wrapper forms will be conducted to evaluate for potential strengths and weaknesses of the delivery of curricular content.

Potential Impact: The end goal of this project will be to have the Exam Wrapper form broadly incorporated into the preclinical curriculum as an aid to assessment-based learning. Additionally, this form may be an improvement on the Learning Improvement Plan Pre-Meeting Reflection form used to direct meetings with struggling students.

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Using Medical TV Shows to Discuss the Role Racism Plays in Health Disparities

Peace Nwanguma

Idea: A study on medical students' television viewing habits showed that more than 80% of medical students watch television medical shows and these shows often stimulated students to discuss bioethical issues with friends and family¹. The purpose of this research aims to use an episode of *The Resident* to test how effective medical TV shows can be in helping students learn and discuss the impact of institutional racism in medicine as it applies to one of the biggest contemporary racial health disparity: maternal mortality.

Need/Rationale: With current methods to prioritize discussions of the impacts of racism in healthcare, there remains a challenge for faculty facilitators and medical students to push past the awkward discomfort of having interracial conversations of the impact of racism in healthcare². More research needs to be done on methods to increase meaningful interracial dialogue among medical students while also educating students on the role racism within medicine plays in health disparities².

Methods/Evaluation: Students will watch an episode of *The Resident* that is based off a true story of the contribution of racism in maternal mortality rates of black women. Discussions of the episode will be had among first year medical students in small groups with at least one physician serving as a facilitator. To measure the efficacy of this activity, a cross sectional study will be designed in which students take a pre-test and post-test based on a refined version of the G Evaluation Survey for Racism and Health. The pre-tests will be given to assess the current knowledge students have of the impact historical and contemporary forms of institutional racism plays in the racial disparity seen in maternal mortality. The post test will analyze their knowledge after viewing and discussing the episode. Both tests will also be used to analyze how comfortable students felt in speaking up about racism prior to and after viewing the episode.

Impact: This project is ultimately intended to develop an impactful method to prepare future physicians to feel empowered to speak up and advocate against the effects of institutional racism in medicine regardless of their race or specialty.

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Efficacy of educational videos in newly diagnosed type 2 diabetics with low health literacy

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Idea: This study aims to evaluate the efficacy of videos as a new medium for educating newly diagnosed, type 2 diabetics with low health literacy on insulin management.

Need/Rationale: Patients with low health literacy have been shown to face a variety of problems ranging from insurance coverage to illness understanding (Vernon et al., 2007). Some studies suggest that physicians tend to overestimate the literacy of their patients especially in minorities (Kelly and Haidet, 2007). Additionally, patients with low literacy may be less forthcoming about their understanding of their diagnosis and treatment plan. Physicians have a responsibility to educate not only themselves, but their patients as well. Educational videos have been used in newly diagnosed diabetics in similar studies, without health literacy assessments, with successful outcomes (Shue et al., 2010).

Methods: In this prospective, randomized-controlled study, newly diagnosed diabetic patients at the ECU Family Medicine Center will be screened for low health literacy using the HLS/SNS composite (Luo et al., 2018). Participants that meet inclusion criteria based on age, insurance, health literacy, and onset of diagnosis will be randomly assigned to receive either the current standard of care or an educational video about insulin management. Pre/post-test assessments and biometric data will be obtained immediately after consent and 3 months later. Results will be analyzed using a two-sample t-test and the Mann-Whitney U test to draw conclusions between the two groups biometric data.

Evaluation Plan: Outcome measures of this study include patient assessments, blood glucose levels, and hemoglobin A1c levels. The assessments will follow a 5-point Likert scale and will be administered upon consent, after administering the selected medium, and 3 months later. Biometric data will be obtained upon consent and 3 months later.

Potential Impact: This study will provide additional data on educational video efficacy as a new medium for diabetic patients. Findings could potentiate the use of educational videos in other patient populations as well. Long term, this study could guide providers in deciding the best medium to use in a primary care setting when treating patients with low health literacy.

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Service-Learning Distinction Track

Program Director: Jennifer Crotty, MD

Authors: LaQuanda Fredericks, Shantel Creek

Acknowledgments: Jessica Barbee, Lisa Clemons-Boyd

Outreach in Diabetic and Hypertensive Patients serves to Educate and Provide Necessary Resources during Covid-19 Pandemic.

What?

Access East coordinates patient care in eastern North Carolina to medically complex and at-risk populations, from Medicaid patients to those without insurance.

So What?

With our current climate of the Covid-19 pandemic, there was an increase of about 27 million in the uninsured population in May due to a loss of full or partial employment. These numbers were still expected to increase in the following months. More patients may have trouble managing their condition and obtaining the necessary resources to effectively manage chronic conditions, including diabetes and hypertension.

Therefore, my objective is to increase public health outreach through phone calls which can serve as a means to educate patients about their conditions, assess patient need and coordinate care to the resources needed to manage conditions.

Now What?

Patients who previously presented to Greenville Community Shelter Clinic, Oakmont, Pitt Care Community Clinic, Bernstein and Agape with a history of Diabetes and/or Hypertension were documented. Patient outreach, via phone, were conducted to educate patients about their condition, assess patient well-being and needs, and potentially connect valuable resources.

Future plans include continuing patient outreach to ensure that patients are educated and have the necessary tools to effectively manage Diabetes and Hypertension.

Our Future... Summer Program

What? This summer we worked with adolescents to host a summer program that exposed children to activities in the following three areas: health and wellness, career exploration, and leadership development. At the beginning of the summer we took a survey to gauge their exposure to careers in healthcare, their self-image as a leader and their understanding of specific terms as well as leader characteristics. Our goal was to expose students to careers in healthcare, teach them important information pertaining to adolescent African American health, and key leadership characteristics and qualities.

So What? The camp allowed students an enrichment opportunity during the summer months when they were not in school. Students gained valuable exposure to careers in healthcare which many students had no prior exposure to. We utilized lectures, open discussions and hands on learning activities to teach the children about the various topics of focus.

Now What? The children we worked with were receptive to our program and we received good reports from program staff about the children valuing the program and looking forward to future events. Our hopes are to continue the program as an after-school program biweekly on Fridays with children from elementary school through middle school.

Development and Institution of a Virtual Platform for Physiology Camp

Authors: Lauren Moore, Jahnvi Meka, Karen Macia, Holly Ingram, Obeth Bahena Gutierrez

Acknowledgements: Thank you to the Brody School of Medicine Service-Learning Distinction Track and the Physiology Camp team members for making this project possible.

What?

Physiology Camp began in 2012 as a general science camp in Goldsboro, NC. Feedback from camp leaders and campers indicated the most interesting portion of the camp was learning about the human body. Throughout the years, the camp has evolved and expanded to include all age groups and multiple groups such as Operation Sunshine, Third Street Academy, and Boys and Girls Club. The founding mission of the Physiology Camp is to promote interest in the healthcare field within the underserved population to increase the healthcare workforce and empower the minority, rural and underserved communities by increasing representation in the field.

So What?

The COVID19 pandemic forced many educators to change from in person delivery to virtual platforms. Yet, when comparing online learning to in-person learning, several studies show that students receiving online lessons reported poorer experiences than those receiving in-person lessons.¹ Students in an online course may perform the same as their counterparts in a traditional classroom, however, literature shows these students' satisfaction and educational experience suffers.² Although most studies focus on college level education, barriers for younger students include lack of internet access, internet capable devices, and shorter attention spans. In order to cater to different needs of younger students, studies show that online learning must include multimodal features such as animation, sound effects, and visual aids.³

Now What?

Due to COVID19, a virtual platform is being developed. The heart of the camp is using anatomical models and healthcare equipment to engage the students and ensure that they are understanding the material being presented to them. To mimic that in our virtual "Distance Camps," we have created an online curriculum with PowerPoints, animations, and activities for the students. Students will be able to sign up for camp at a time that works for them and will be led through the session by a graduate student in the healthcare field. With the launch of the Distance Camps, research will be completed to compare the knowledge gain from students participating in in-person camps versus those participating in the virtual camps.

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Increasing Access to Harm Reduction Supplies during COVID-19

Authors: Joshua Parke, Dianne Carden-Glenn, Michael Lang M.D.

Acknowledgments: Thank you to Jennifer Crotty M.D., Tom Irons M.D, ekiM Syringe Service Program, Pitt County Health Department, ECU Simulation Lab, and ECU Physicians for making this project possible.

What? Syringe Service Programs are an effective and evidence-based way to facilitate safe disposal of used syringes while providing free sterile syringes and risk reduction education to people who inject drugs (PWID).¹ ekiM Syringe Service Program provides clean needles, syringes, naloxone, and offers referrals to treatment centers in Pitt County.

So What? In May 2020, there were 56 emergency department visits for opioid overdoses in Pitt County, a 37% increase from the 41 visits in May 2019.² The number of opioid overdoses has the potential to rise due to the COVID-19 pandemic.³ SSPs can reduce overdose deaths by educating PWID on how to prevent and respond to overdoses by educating about and providing the life-saving opioid reversal drug, naloxone.⁴ In addition to increased risk of contracting HIV and HCV, PWID are at an increased risk for soft tissue infections, such as abscesses, and serious bacterial infections, such as endocarditis and bacteremia. Proper education on safe injection techniques and soft tissue infections is lacking and has the potential to help clients avoid serious bacterial infections.

Now What? This project aims to address the risk of opioid overdoses and the spread of bloodborne infections caused by intravenous drug use. ekiM Syringe Service Program provides services aimed at increasing access to harm reduction supplies for those without transportation to the fixed site. We will also educate clients, both in person and by video, on safer injection techniques and proper self-treatment of skin and soft tissue infections. Additionally, we aim to partner with the Pitt County Health Department to organize periodic onsite influenza and hepatitis A and B vaccination clinics during the already occurring Saturday exchanges.

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Title: Implementation of a Vaccination Program and Shared Electronic Health Record at Free Community Clinics in Greenville, NC

Authors: Anna Beth Robertson, Grant O'Brien, Shantell Cheek, RN, MAEd, Marissa Carraway, PhD, David Collier, MD

Acknowledgements: Thank you to the North Carolina Schweitzer Fellowship and the Brody School of Medicine Service-Learning Distinction Track for making this project possible.

What?

The Greenville Community Shelter Clinic (GCSC) is a student-run free clinic that serves the homeless population of Greenville, NC. The Pitt County Care Clinic (PCCC) and Oakmont are similar free clinics in Greenville. Many of the patients at GCSC utilize the other free clinics in the area. The social workers for all of the free clinics are based at an organization called Access East. GCSC currently uses an Electronic Health Record (EHR) while PCCC and Oakmont operate with paper charts.

So What?

Homeless individuals are at higher risk for Hepatitis A Virus (HAV) infection and severe infection-associated outcomes.² In 2018, the Advisory Committee on Immunization Practices (ACIP) recommended that all persons aged 1 year and older experiencing homelessness should be routinely vaccinated against Hepatitis A.² The Centers for Disease Control (CDC) holds that there are significant benefits in vaccinating people experiencing homelessness, and the costs and risks of vaccinating are much lower than the risk and potential cost of not vaccinating.² A two-dose inactivated Hep A vaccine can induce protective efficacy of >90% and prevent HAV infection.²

EHR systems can decrease fragmentation of care by improving care coordination. EHRs have the potential to integrate and organize patient health information and facilitate its instant distribution among all authorized providers involved in a patient's care.¹ The North Carolina Association of Free and Charitable Clinics (NCAFCC) does not require an EHR for free clinics, but it is strongly incentivized by limiting community health grant funding to clinics who use an EHR and connect with the state's Health Information Exchange.

Now What?

We will work with the local health department to start a Vaccination Program at GCSC that will be held every Monday clinic. The clinic will offer Hepatitis A vaccines and seasonal influenza vaccines. We hope to eventually offer COVID-19 vaccines once available. The clinic will serve as a teaching opportunity for medical students to learn to administer vaccines. We will secure a cloud-based EHR that will be shared between the free community clinics to improve continuity of care for patients, expedite referrals, and allow our social workers at Access East to have easier access to patient information.

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Summer Scholars Research Program

Program Director: Kori L. Brewer, PhD

Title:

Does Caries Risk Assessment Affect Operative Treatment of Adults at the ECU School of Dental Medicine?

Authors:

Laura Bauza-Davila¹, Dr. Roopwant Kaur², Dr. Mark Moss³, Gerard Camargo⁴

1. Student, ECU SoDM 2. Division of Operative Dentistry, ECU SoDM 3. Department of Foundational Sciences, ECU SoDM 4. ECU SoDM

Abstract:Background:

- Preliminary research has shown that only 17% of the adults in the axiUm database at East Carolina's School of Dental Medicine (ECU SoDM) have a Caries Risk Assessment (CRA) form completed.
- This assessment form serves as a diagnostic tool for providers to not only to assess risk factors and determine probability of developing a new cavity in the near future and their preventive/operative treatment plan with added beneficial protective factors, but it also heightens patient awareness and knowledge in order to improve and maintain their oral health status. This summer, we investigated if caries risk assessment affects operative treatment decisions at the ECU School of Dental Medicine.

Hypothesis:

- The percentage of patients deemed to be at high risk for caries according to the CRA, are more likely to receive posterior amalgam restorations over posterior composite restorations.

Methods:

- A retrospective data analysis was completed using a database from patients at ECU SoDM Community Service Learning Centers (CLSCs) from January to July, 2019. Using the clinical data, caries risk status' and posterior restorative procedures were tracked longitudinally and then analyzed.

Results:

- Based on patient risk levels, posterior composite restorations were more frequently used as compared to amalgam restorations in high risk population.

Conclusions:

- Although several posterior preventative and restorative treatments were looked at, amalgams and composites were most commonly used.
- Based on the data, patient risk status did not seem to be considered while choosing preventative /operative treatment measures.
- Several clinical protocols/ tools were developed to enhance patient interaction, student/provider communication, faculty calibration as well as compliance overall, in an effort to better serve out patient population in Eastern North Carolina in the future.

COVID-19 Persistent PCR Positive Tests Cause Treatment Delays and Increased Length of Stay

Rahim A. Jiwani^{1*}, MD; Rachel Roper², PhD; Adrian Pona¹, MD; **Evan Bradner², BS BA**; Jaffer Hussain¹, MD; Paul Cook³, MD; Ashley Burch⁴, PhD; Felix Afriyie¹, MD; Jonathan Labbe¹, MD; Ahmed Younes¹, MD; Mai Badr¹, MD; Elisabeth Lee¹, PhD and Yuxuan Mao¹, MD MS

Affiliations: Brody School of Medicine East Carolina University 1. Department of Internal Medicine 2. Department of Microbiology and Immunology 3. Division of Infectious Disease and International Travel Health 4. Department of Health Services and Information Management

Abstract

Background: Transmission-based precautions, including hospital isolation, are in place to prevent the spread of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Discontinuation of transmission-based precautions for Coronavirus disease-2019 (COVID-19) hospitalized patients can be achieved through the CDC's recommended test- or symptom-based approach. These approaches yield different results and confound clinical decision making.

Objective: To evaluate the consequences of the test-based strategy for discontinuation of transmission precautions.

Methods

Design: Retrospective Cohort Study.

Setting: Vidant Health System, Eastern North Carolina.

Participants: Hospitalized subjects with COVID-19.

Measurements: Hospital length of stay, days in isolation unit, date appropriate for discharge or isolation discontinuation based on the symptom-based strategy, days a procedure was delayed.

Limitations: Subjectivity of defining improvement in respiratory symptoms.

Results: 196 COVID-19 PCR confirmed subjects were evaluated for inclusion, 34 were identified as having a repeat test ≥ 3 days from admission. Of the 34 subjects, 17 could have been discharged earlier if the symptom-based strategy was used instead of the test-based strategy; this resulted in an additional 174 days of hospitalization. This cost an estimated \$435,000 to the health care system. Further, 2 subjects had a combined 16-day delay in necessary medical procedures.

Conclusion: The PCR SARS CoV-2 test-based strategy for discontinuation of transmission-based precautions has disadvantages when compared to the symptom-based strategy. Test-based strategies in immunocompetent patients may lead to unnecessary increased length of hospitalization and healthcare costs as well as delays in medical procedures.

Sex Differences in Systolic Blood Pressure and Renal Function in Unilateral Renal Artery Stenosis

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Abstract:

Incidence of hypertension is greater in men than women of reproductive age, yet, hypertension occurs more frequently in postmenopausal women than men of the same age. Despite mounting evidence of sex differences in the development and progression of hypertension, there are currently no guidelines that differentiate hypertensive treatment for men and women. Further research is needed to understand the pathophysiological mechanisms that underly hypertension in men and women to develop a more effective drug therapy. The aim of this study is to characterize sex differences in response to unilateral renal artery stenosis through measurements of systolic blood pressure and renal function. We hypothesize estrogen will mitigate blood pressure responses serving a protective role in the renal vasculature of 2K1C hypertensive rats. To accomplish this goal, male, female and ovariectomized (OVX) Sprague-Dawley rats 3-4 weeks of age will undergo unilateral artery contraction by placement of a 0.2mm silver clip on the left renal artery. Four groups of rats will be used- clipped males, clipped females, clipped OVX and intact control females. Assessment will include systolic blood pressure monitoring via plethysmography, biweekly metabolic measurements and clearance studies to examine renal function. 21 days following renal artery clipping, systolic blood pressure had risen to 196 ± 4 mmHg from a baseline of 120 ± 3 mmHg in males. Similarly, on day 21 systolic blood pressure of OVX 2K1C rats had risen to 199 ± 13 mmHg compared to 123 ± 2 mmHg at baseline. Systolic blood pressure of female 2K1C rats was 176 ± 8 mmHg on day 21 compared 120 ± 3 mmHg at baseline. Male 2K1C and OVX 2K1C rats showed significantly higher systolic blood pressure compared to female 2K1C and controls on day 21. Glomerular filtration rate (GFR), renal plasma flow (RPF) and renal blood flow (RBF) are a work in progress; however, preliminary data suggest GFR, RPF and RBF are higher in nonclipped kidneys than in clipped kidneys. GFR, RPF and RBF were higher in control rats compared to both clipped and nonclipped kidneys. These results demonstrate that female rats may be protected against renal injury and hypertension due to the protective role of estrogen.

Title: Provider communication and fever protocol for children with sickle cell disease in the emergency department

Authors: Mohit Chandi¹, Adelaide Robbins¹, Andrea Whitfield DO^{1,2}, Dmitry Tumin PhD^{1,2}
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Abstract:

Sickle cell disease (SCD) is a genetic hematologic disorder which results in abnormally configured red blood cells (RBCs). Children with SCD are faced with many complications including splenic dysfunction which increases their risk of severe bacterial infections and even death. For these reasons, emergency departments (EDs) are usually the first place of contact for children with SCD. The National Heart, Lung and Blood Institute (NHLBI) treatment guidelines for febrile illness in children with SCD recommend administration of parenteral antibiotics within 30-60 minutes of arrival at the ED. Poor communication between ED providers and hematologists/primary care physicians prior to patient arrival is a notable barrier to prompt treatment. We hypothesize that ED-hematology communication will facilitate increased adherence to NHLBI guidelines in the management of children with SCD in the ED, particularly with regards to timely administration of parenteral antibiotics. We performed a retrospective chart review of febrile children age 2 months to 21 years with SCD who presented to the Vidant Medical Center (VMC) ED between January 2015 and December 2019, and compared their treatment and outcomes according to whether pediatric hematologists were able to communicate with ED providers prior to arrival. Study outcomes and patient characteristics will be compared using Chi square tests, Fisher's exact tests, or rank-sum tests, as appropriate. Further analysis will use multivariable logistic regression to assess the impact of ED-hematology communication on appropriate time to antibiotic administration and adherence to NHLBI guidelines. The results for this study are currently still pending.

Title: Oncologic colon resection surgery outcomes – short term outcomes of a single academic institution in Eastern North Carolina

Authors & Affiliations: Alexander L Doudnikoff¹, Akram Warqaa², Patrick Brilliant², Emmanuel Zervos², Nasreen Vohra²

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²Department of Surgery at Vidant Medical Center

Abstract:

Colorectal cancer is the third most common diagnosed cancer in both men and women in the United States. It is estimated that the overall lifetime risk of developing colorectal cancer is 1 in 23 (4.4%) for men and 1 in 25 (4.1%) in women.¹ Current treatment therapies include surgery with three modalities: open, laparoscopic, and robotic assisted surgery. Robotic assisted surgery is a newer modality, and many studies have shown that it is just as successful when compared to laparoscopic and open. In order to make this comparison for short-term outcomes from an oncologic standpoint, the number of lymph nodes harvested and resection margins must be observed. From a surgical standpoint, length of stay, readmissions, postoperative complication, reoperation, anastomotic leak incidence, the need for unplanned diversion, and patients discharge location are observed.

We set out to determine if robotic assisted surgeries made improvements in short-term oncologic and surgical outcomes for patients with colon cancer, and thus could provide a huge benefit in rural communities who typically have patients who face more barriers and have more medical comorbidities when it comes to their health.

An IRB approval was obtained before retrospectively searching for patient charts from any colorectal surgeon or surgical oncologist who performed an operation colon surgery or colectomy from 2016 until 2020. We then defined an exclusion and inclusion criteria by selecting for patients aged 18 and older who had a diagnosis of cancer or unresectable lesion with pathology consistent with cancer. Their surgeries included lesions from the terminal ileum to the rectosigmoid. The surgery was done selectively or non-emergently within the same hospital admission if admitted from the ER.

A total of 254 patients were identified to include in this study with additional still to be added. We obtained data comparing the three modalities to determine if robotic assisted surgery is advantageous for patients in a rural setting; however, more statistical analysis must be completed in order to come to any conclusion.

Reference:

1. American Cancer Society. Key Statistics for Colorectal Cancer. 2020. <https://www.cancer.org/cancer/colon-rectal-cancer/about/key-statistics.html>. Accessed July 25, 2020.

Code Stroke Activations in the ED: An Evaluation of Practice

Allison Mainhart, Dr. Cassandra Bradby, Dr. Nicholas Russell, Lindsey Lang, Michael Moseley
Savan Gandhi

Vidant Medical Center Emergency Department

Background:

Stroke is the fifth leading cause of death and accounts for \$34 billion in medical costs in the United States annually¹. It is imperative to diagnose a stroke early and accurately so that patients can receive appropriate interventions and avoid unnecessary costs.

Objective/Hypothesis:

We hypothesize that we will determine an NIH stroke scale level, as well as other variables pertaining to patient demographics, medical history, and presentations, that will predict the likelihood of a stroke.

Methods:

This is a retrospective, cross sectional, observational analysis of patients presenting as a code stroke activation to Vidant Medical Center Emergency Department from 1/1/2015 to 12/31/2019. It has been approved by the local IRB. Inclusion criteria includes patients ≥ 18 years old with a code stroke activation. Exclusion criteria includes transfer patients.

Of the patients that meet the inclusion criteria, age, sex, race, and ethnicity were collected. Initial ED and Stroke Team NIH scores, and discharge NIH and MRS scores were collected. Onset of symptoms, door to CT, door to tpa, length of stay in hospital, and length of stay in ICU were collected. Pertinent medical, social, and medication histories were collected. Radiology and laboratory results, vital signs, and interventions were collected.

A logistical regression model will be used to determine an NIH stroke scale level as well as identify variables that are predictive of a stroke.

Results:

Thus far, 1,283 charts have been reviewed, with 339 charts meeting our inclusion criteria. Current trends include the high prevalence of prior stroke, diabetes, atrial-fibrillation, dyslipidemia, smoking, and hypertension in patients that meet criteria. Lower NIHSS numbers seem to correlate with better outcomes and a diagnosis other than stroke. Higher NIHSS scores seem to correlate with worse outcomes and a stroke diagnosis.

These are our current speculations. The results will be updated once data analysis is completed.

Conclusion:

By applying these predictive variables to the patient population presenting to the Vidant Medical Center Emergency Department, code stroke activations will be appropriately initiated and unnecessary radiation exposure and medical costs will be decreased.

This is the study significance that we hope to conclude once data analysis is completed.

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*references 2 & 3 are the manuscript and already crafted abstract respectively for this project and were greatly used in the construction of this abstract.

Pulmonary function changes during the transition from pediatric to adult cystic fibrosis care

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Tumin, Dmitry; East Carolina University, Brody School of Medicine, Department of Pediatrics

Background:

With the advances in early detection and combination therapy, the projected median life expectancy of Cystic Fibrosis patients is 47.4 years as of 2018. The increasing longevity of this population has made it necessary to develop transition guidelines that address the growing number of adolescents aging out of pediatric care. Transition of care is associated with a decline in pulmonary function, but this may be moderated by affiliation between pediatric and adult CF care centers.

Objective/Hypothesis:

We will determine how the association between transition of care and FEV₁pp (forced expiratory volume in 1 second, percent predicted) trajectory in patients with CF is moderated by the type of pediatric program (e.g., at an attached children's hospital, vs. a free-standing children's hospital) which initiates the transition process.

Methods:

This study will use de-identified data from the CFFPR (Cystic Fibrosis Foundation Patient Registry), which contains information on patients with CF who were treated at one of over 150 accredited CF care centers. We will include patients tracked in the registry between 16 years and 25 years age. Pediatric and adult program designations will be retrieved from the CF Foundation accredited program list. Transition to adulthood will be defined as a change in the center reporting on each patient from a pediatric to an adult program. Pediatric programs will be classified as those based in free-standing children's hospitals (according to a review of the program web site) vs. all others. FEV₁pp data will be analyzed using mixed effects linear regression.

Results:

In progress.

Conclusion:

When pediatric and adult subspecialty programs are based in the same institution, programs may share staff and have improved coordination around the time of care transition, reducing gaps in care during this vulnerable period. We expect to find that CF patients who transitioned from an attached children's hospital to the affiliated adult program will have a smaller decline in their FEV₁pp, compared to patients transitioning from a program based in a free-standing children's hospital.

Treatment of a Teratoma by En Bloc Lung Resection and Phrenic Release in a Child

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Teratomas are germ cell tumors made up of embryonic ectoderm, endoderm, and mesoderm, most commonly found in the gonads. Mediastinal teratomas make up only 7% of teratomas, and are normally found in pediatric patients. Treatment typically involves excision by video-assisted thoracoscopic surgery (VATS), though the literature on the management of mediastinal teratomas is sparse.

A 12-year-old female with no previous medical history presented to the Emergency Department with a chief complaint of left shoulder and back pain. Computed tomography (CT) of the chest revealed a large mass in the left anterolateral mediastinum with suspected phrenic nerve involvement, left pleural effusion, and atelectasis of the lower lobe. Biopsy samples and pleural fluid were obtained that revealed a mature teratoma with sebaceous units and epidermis-like tissue. VATS was performed to excise the tumor. Intimate adhesions were found to portions of the lung, which were resected en bloc with the specimens. Separation and skeletonization of the phrenic nerve were carried out through dissection to surrounding vasculature, while maintaining pleura en bloc with the specimen. The tumor was removed, and remnant anterior mediastinal tissue was resected to confirm negative margins. The patient was discharged on post-operative day 2 without complications. Follow-up CT 4 months later showed complete re-expansion of the lower lobe with no recurrence.

Although VATS has shown to be a safe method for removing mediastinal tumors, it can be limited by tumor size or adhesions to surrounding structures. However, the minimal invasiveness of VATS made it a more suitable option for this patient. Phrenic nerve involvement became an area of concern, but a post-operative fluoroscopic sniff test showed improved diaphragm function after tumor resection. This case demonstrates that VATS is a feasible approach for removing an anterior mediastinal teratoma with phrenic nerve involvement and adhesions to surrounding structures.

Collagen Peptide Inhibits Fibroblast Differentiation: A Potential Anti-Fibrotic Factor

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Abstract:

Upon injury or disease, fibroblasts differentiate into myofibroblasts; these cells, which have a secretory and contractile phenotype, are the main source of fibrosis. Myofibroblasts have been shown to associate with adverse left ventricular (LV) myocardial remodeling leading to progressive loss of cardiac function. Matricryptin p1159, a biologically active collagen-derived peptide, has previously been shown to change fibroblast function and reduce fibrosis in a mouse model of adverse LV remodeling.

Accordingly, we hypothesized that p1159 reduces fibrosis by delaying or inhibiting fibroblast transition into myofibroblast. To test our hypothesis, we first induced human cardiac fibroblast (HCF) differentiation [5 ng/mL transforming growth factor (TGF- β) in low serum media (LSM; 0.5% FBS media)] in the presence or absence of p1159 (100 nM, 500nM, and 1 μ M). Then, we isolated RNA and protein to measure myofibroblast markers, namely α -smooth muscle actin (α SMA), collagen-I, collagen-III, and fibronectin.

p1159 did not induce α SMA expression, in fact at higher doses it inhibited α SMA. Moreover, when cells were incubated with TGF β in the presence of 100 nM and 1 μ M p1159, α SMA expression was at the same level as the negative control (LSM). These results suggested that p1159 inhibits, or delays, fibroblast differentiation *in vitro*. While p1159 did not affect expression of collagen-I and fibronectin 1, our results show the combination of p1159 and TGF β induced overexpression of both collagen-III and TGF β for all concentrations tested.

Overall, our data support a role of p1159 in fibroblast differentiation into myofibroblast. During fibrosis, TGF β and collagen-III are present early in the remodeling process, and expression of both was increased with the addition of peptide p1159 in combination with TGF β . The mechanisms behind the synergetic signaling observed between p1159 and TGF β is yet unexplored.

Abstract

Title: A Prospective, Efficacy Study of NuCel in Patients Undergoing Fusion for One, Two, or Three Level Degenerative Disease of the Lumbar Spine

Authors: Brandon Karimian, Graham Mulvaney, MD, Domagoj Coric, MD

Background: Degenerative disease of the spine results from mechanical, pathologic, or metabolic injury to spinal anatomy. The majority of patients experiencing degenerative disease of the spine have pathology related to the intervertebral disk (IVD) and are further classified into two subcategories: Degenerative disc disease (DDD) or prolapsed intervertebral disc (PID). Symptomatic lumbar etiologies are historically treated using lumbar interbody fusion (LIF) in unison with graft, cage, and pedicle placement. Physician preference for treatment is variable, however, posterior lumbar interbody fusion (PLIF) and transforaminal lumbar interbody fusion (TLIF) are most used. In unison with LIF it has been shown that application of graft has allowed more effective fusion at 1 and 2 year post-operatively. Grafts fall into autograft, allograft, and bone graft substitute. Historically, the preferred graft has been an autologous bone graft (ABG), but many other options are available including demineralized bone matrix (DBM), bone morphogenetic protein (BMP), and placental derived tissues.

Objective: This was to demonstrate that amniotic placental allograft NuCel is comparable to autograft bone in producing a contiguous fusion at 12 month and 24 month post-operatively when used in lumbar fusion surgery.

Hypothesis: Radiological/clinical performance of NuCel bone graft system is not inferior to historical autograft when used for lumbar interbody fusion.

Methods/Arms: Datapoints from patients that received one, two, or three level PLIF with NuCel allograft between 2014-2018 from Carolina Neurosurgery and Spine associates was compiled using operative and post-operative notes. These included pre-operative data and demographics, intra-operative data, and post-operative data. Fusion status was assessed through 1-year CT and x-ray and 2-year fusion status if needed.

Results: Using binomial conversion of nominal data we found the average one-year success rate to be 85.95% with a 95% confidence interval of 74.21% to 93.74% and p-value of .1688 demonstrating noninferiority. The two-year success rate was 92.98% fusion with a 95% confidence interval of 83.00% to 98.06% and a p-value of .0063 demonstrating non-inferiority and potential superiority.

Conclusion: NuCel allograft demonstrated similar fusion rates to traditional methods including ABG, BMP, and DBM without additional complications.

Determining Trends and Factors associated with Self-Reported Physical Activity among Adolescents in Rural North Carolina

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East Carolina University, Greenville, NC, United States.

Background: Insufficient physical activity (PA) in the youth can lead to adverse health outcomes, and youth in rural areas have particularly low PA. However, factors contributing to these levels remain unclear. Using data from a middle school-based wellness intervention called Motivating Adolescents with Technology to Choose Health™ (MATCH), we evaluated demographic and environmental factors predicting PA in adolescents across rural North Carolina.

Objective/Hypothesis: To determine predictors of self-reported number of days of at least 60 minutes of PA for MATCH participants in the 2018-2019 school year.

Methods: We used cross sectional data from MATCH participants in 40 schools. Self-reported PA was determined from a validated question: “How many days each week are you active for at least 60 minutes?”, with results dichotomized into those achieving 1, 5 and 7 day(s) meeting the threshold. Other variables included sex, race, weight category determined from Body Mass Index percentile, and PACER score (measuring cardiovascular fitness). Environmental variables from a previous study included one county level determinant (access to exercise opportunities), and two school level determinants (physical education (PE), PA opportunities). Each school was given an environmental score from 1-5 (higher = better environment). Analyses included appropriate measures of descriptive statistics (mean, t test, Chi Square), correlation (Pearson, Spearman), and regression models.

Results: Participants included 3,799 7th graders, approximately half male, half white, mean age of 12.7 years, and 27.8% obese. Male sex ($p < .0001$), white ($p < .0001$), and healthy weight ($p < .0001$) participants reported more days PA. Associations between the environmental variables and self-reported PA yielded statistically significant but extremely weak ($|r| \leq 0.1$) relationships; however, school PE and PACER ($r = .27$, $p < .0001$) were correlated. Regression models showed significant independent relationships of self-reported PA and school PE ($B = .108$, $p = .0011$) and race ($B = -.306$, $p = .0005$).

Conclusion: Adolescents in rural NC report low PA, but more is reported by male, white, and healthy weight participants. School PE may increase student PA. Studies are warranted evaluating PA differences by race and sex.

Influenza vaccination status of patients admitted to the Vidant Medical Center inpatient behavioral health unit

Authors

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Influenza is a significant cause of morbidity and mortality. Influenza vaccination screening rates are used by the Centers for Medicare and Medicaid as a metric of quality inpatient care. During the influenza season, October 2018 through March 2019, Vidant Medical Center (VMC) had to close its inpatient Behavioral Health Unit (BHU) due to an outbreak of influenza on the unit. Behavioral health units present unique risk for the spread of communicable diseases due to high levels of interactions among the patients and the patient population having lower vaccination rates. The objective to this study is to examine the vaccination rates prior to and post admission to the BHU at VMC during the 2018 influenza outbreak along with patient factors that could be influencing this rate. The data will be collected through a chart review of the electronic medical records of patients admitted to the BHU at VMC throughout October 2018 to March 2019. Factors considered include age, sex, psychiatric diagnoses, medical comorbidities, last medical contact, type of last medical contact, payor, employment status, housing circumstances, and highest level of education. An improved understanding of vaccination rates for psychiatric inpatients, as well as factors affecting vaccination, may inform future interventions to increase influenza vaccination rates. In addition, not having to close the BHU due to a communicable disease can prevent financial loss for the hospital. Data collection is currently still in process.

Title: Transportation Barriers to Cancer Care Delivery: A Review.

Authors:

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ABSTRACT

Importance:

Rural patients with cancer present with more advanced disease at diagnosis and experience worse survival compared to urban patients. Not only do patients living in rural regions face increased travel distance to care, but many also lack reliable access to transportation for cancer screening and treatment. However, the extent to which rural patients experience transportation barriers and the impact on clinical outcomes is not well understood. The purpose of this narrative review is to summarize the literature regarding travel distance and transportation barriers to care for rural patients in order to inform the design of future studies aimed to reduce rural-urban cancer disparities.

Observations:

Compared to the general population, patients residing in rural areas often must travel a significant distance (≥ 60 miles) for specialized oncology care.

Minorities, those living in rural areas, and those residing in southern states were found to have approximately double the travel time to the nearest Cancer Center when compared to the overall U.S. population. Particularly, Hispanic and black populations were shown to have the least amount of access to cancer care facilities, both parent and satellite NCI cancer centers. The degree of cancer care specializations further increased travel time. This poses a great problem for minority patients in particular as they have reported transportation, finances, and insurance as significant sources of distress. Cancer care requires specialty surgical and medical resources that are less likely to be found in rural areas which further increases the urban-rural health disparity.

TRENDS AND LYMPH NODE OUTCOMES OF PARTIAL CYSTECTOMY FOR MUSCLE-INVASIVE BLADDER CANCER

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INTRODUCTION AND OBJECTIVES:

The 'Gold Standard' treatment for muscle invasive bladder cancer (MIBC) consists of platinum-based neoadjuvant chemotherapy (NAC) with radical cystectomy (RC), pelvic lymph node dissection (PLND), and urinary diversion¹. Alternatively, partial cystectomy (PC) provides a full thickness excision of the bladder that preserves organ function with significantly lower surgical morbidity^{2,3}. However, these patients have a high rate of intravesical recurrence that may require salvage treatment with increased concurrent mortality⁴. Although the appropriate extent of PLND remains undefined, previous work has demonstrated the survival benefit of a thorough node dissection in RC⁵⁻⁷.

We seek to identify trends in the PC approach and compare outcomes in patients who receive RC or where PLND was omitted with the goal to further define the role of PC and PLND in the treatment of MIBC.

METHODS:

A retrospective cohort analysis of 13,652 cT2N0M0 patients who underwent PC and RC between 2004-2016 was performed using the National Cancer Database (NCDB). The primary outcome was survival, analyzed using Kaplan-Meier and multivariable Cox-proportional hazards regression. A univariable logistic regression model of treatment was used to identify treatment trends over time. Multivariable models were adjusted for confounding demographic and clinicopathologic variables.

RESULTS:

Of the 13,652 patients identified, 726 (5.3%) received PC and 12926 (94.7%) received RC. From 2004-2016, the use of PC decreased from 8% to 3.2% ($p < 0.001$) with PLND increasing from 44.2% to 57.1% ($p < 0.001$). Relative to RC, PC was associated with significantly decreased adjusted odds of 90-day mortality (aOR=0.70), significantly better adjusted overall survival (aHR=0.85), significantly decreased adjusted odds of readmission (aOR=0.38) and an adjusted 5-day shorter average post-operative hospital stay. However, the PC group was significantly associated with increased adjusted odds of positive surgical margins (aOR=2.01) and salvage adjuvant radiation (aOR=4.95). PC with PLND improved overall survival versus PC alone (aHR=0.75; all respective significance reported $p < 0.05$).

CONCLUSIONS:

PC with PLND is associated with decreased mortality and morbidity compared to RC, but with higher rates of remnant cancer determined by positive margin status. Although PLND in PC has risen in recent years, numbers are low compared to RC contributing to disease reoccurrence and decreasing survival outcomes.

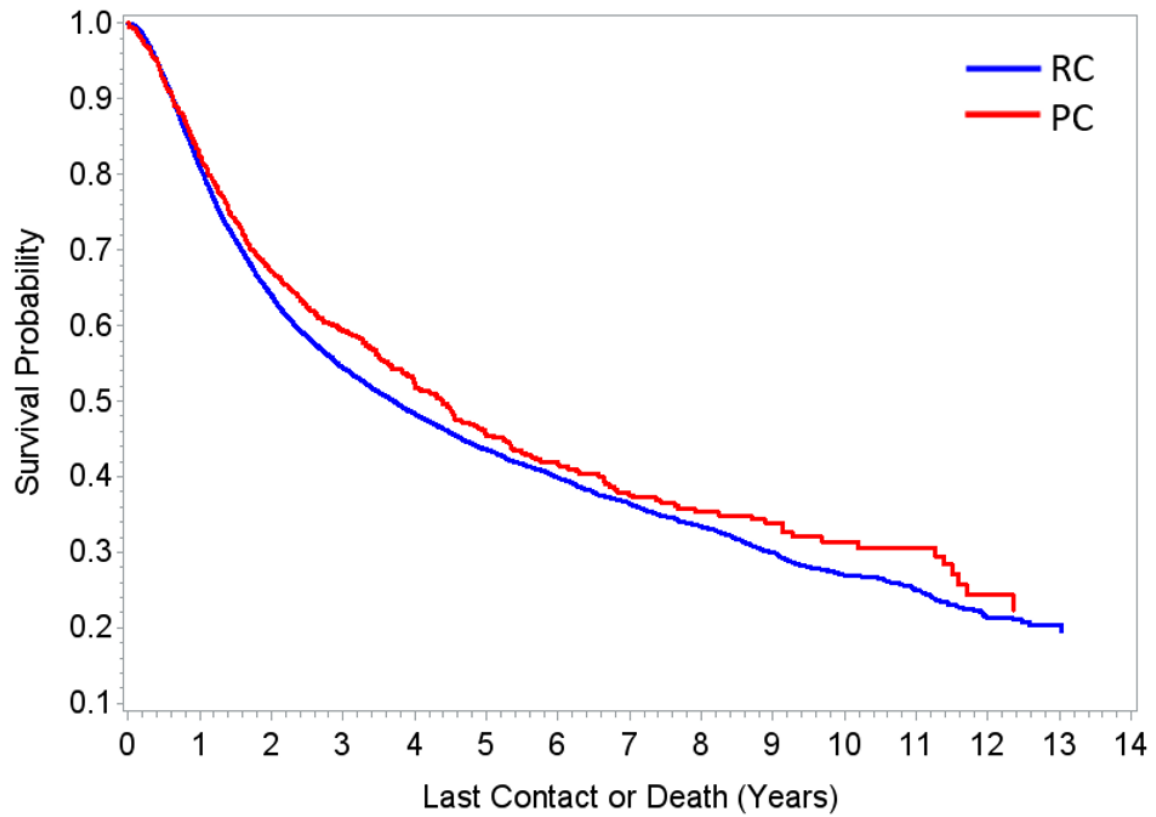
DISCLOSURES:

The author reports no conflicts of interest in this work.

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Figure 1: Kaplan-Meier Curve of Patients Receiving RC versus PC

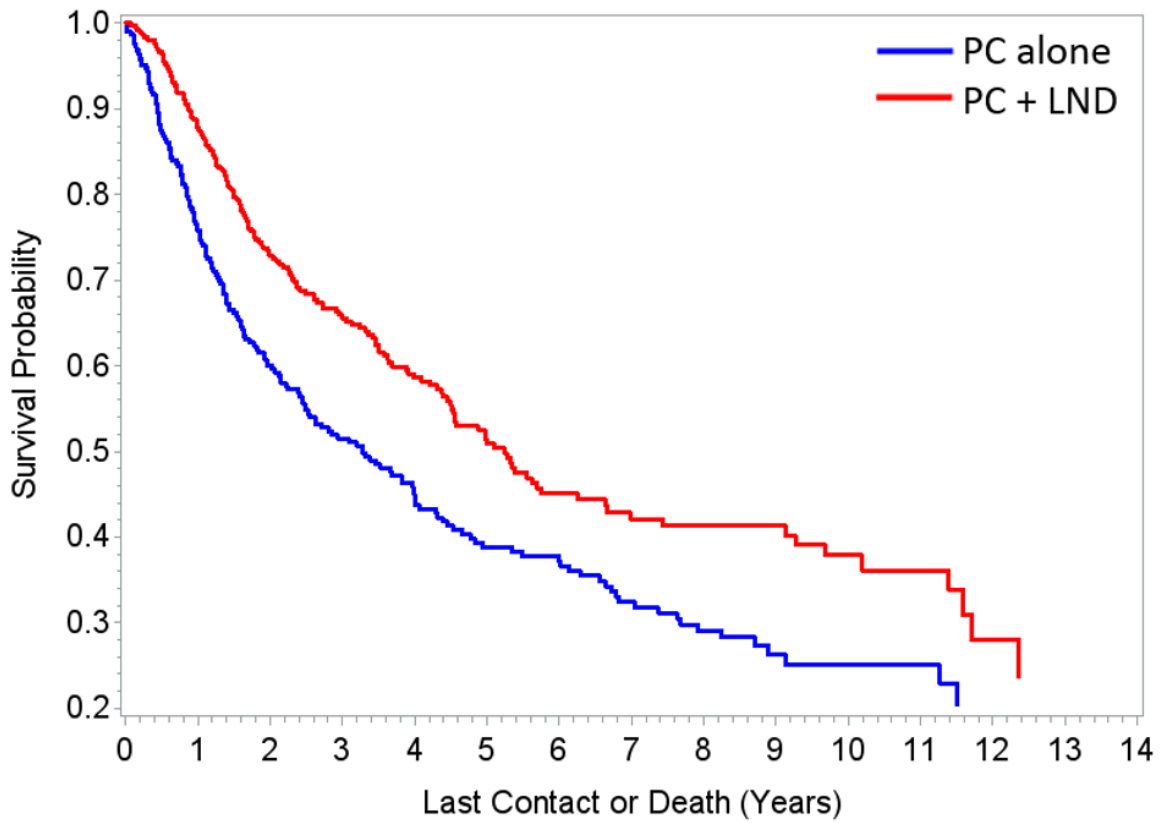


Notes: Log-Rank P-value=0.094.

Before adjusting, we do not detect a difference in survival between PC and RC, although we see a trend towards better survival in PC. In adjusted multivariable analysis, we get a significant survival benefit of PC.

Abbreviations: RC: Radical Cystectomy, PC: Partial cystectomy

Figure 2: Kaplan-Meier Curve of Patients Receiving PC with LND versus PC Alone



Notes: Log-Rank P-value<0.001

Abbreviations: RC: Radical Cystectomy, PC: Partial cystectomy, LND: Lymph Node Dissection

Associations Between Psychiatric Illness and Substance Abuse Emergencies: A Retrospective Review

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Abstract

Background: Psychiatric illness and substance use disorder are commonly seen as a dual diagnosis. The literature thus far suggests that the type of substance used tends to vary based on the psychiatric diagnosis.

Objective: This study examined both the relationship between psychiatric illness and substance abuse and the variation of the substance used based on the psychiatric illness.

Methods: An observational retrospective review of patients presenting to the Emergency Department at Vidant Medical Center in Greenville during 2019 was conducted to examine the association between certain psychoactive substances and psychiatric illnesses. The psychiatric illnesses observed include depression, anxiety, schizophrenia, ADHD, and bipolar disorder. Substance abuse was determined through ethanol levels, a standard urine toxicology screen, acetaminophen levels, and salicylate levels. 982 charts were identified for inclusion in the study. To date, data has been extracted from 393 charts.

Results: Our results have demonstrated that 52.4% of patients with psychiatric illness had some type of substance use, whereas 42.6% of patients with psychiatric illness had no history of substance abuse. Patients with schizophrenia or schizoaffective disorder were noted to be more likely to have used substances than to not have used substances. Patients with anxiety and depression were more likely to have no history of substance abuse than to have a history of substance abuse. Amongst patients with schizophrenia or depression that also had a history of substance abuse, cannabis and ethanol were the most commonly used substances.

Conclusion: Our results demonstrated no significant correlation between psychiatric illness and substance abuse, however cannabis and ethanol were the more commonly abused substances amongst patients with schizophrenia and depression.

Gender Bias's Influence on Attendings Asked to Interpret EKGs in the Emergency Department

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Background: Implicit bias in the workplace has been a subject of growing interest in recent years. There is evidence to support subconscious biases affect women in all fields, including medicine. There is a perception that in the emergency department (ED), nursing staff will preferentially go to the male attending physician for electrocardiogram (EKG) interpretation. We conducted a retrospective chart review on ED patients at Vidant Medical Center to study the effects of gender bias.

Objective/Hypothesis: We hypothesize that male emergency medicine attendings are asked to interpret and sign off on EKGs more frequently than female attendings, particularly when the EKG is for a patient not assigned to a physician. We aim to identify general trends regarding gender disparities in EKG reading.

Methods: We selected patients who received an EKG at the Vidant Medical Center Emergency Department between November 2016 and September 2017 while a male-female dyad was working on the "P side" (urgent side). Abstracted data included gender of the attending who read the EKG, gender of the person handing the EKG, whether or not the EKG was assigned to an attending and if so, whether the EKG was read by the assigned attending. Chi-square analysis was performed to identify associations between attending gender and all other variables.

Results: 29,757 charts were identified for inclusion in the study. At the time of analysis, data from 329 charts had been extracted. Our data demonstrated that the EKGs were read by 56% male attendings and 44% female attendings. Of these EKGs 57% were assigned, meaning an attending was assigned to the patient prior to performing the EKG, and 43% unassigned. Of the assigned EKGs, 91% were read by the correct assigned attending and 9% were read by a different attending. Unassigned EKGs were more likely to be read by a male attending ($p=0.003$). Individuals handing the EKG were more likely to give them to an attending of the same gender as themselves ($p<0.001$).

Conclusion: Results suggest that the ED nursing staff is more likely to consult a male physician for interpretation if an EKG is unassigned. Hospital based interventions which address implicit bias may be warranted.

Minimally invasive repair of a Morgagni Hernia on two adult obese patients with mediastinal shifts leads to an improvement on Pulmonary Function and Exercise tolerance

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Morgagni hernias are rare conditions that are due to maldevelopments of the septum transversum which inhibits fusion of the costal and sternal fibrotendinous elements of the diaphragm. Given the rarity of this condition there is no specific recommended surgical method for repairing them. Surgical repair is indicated for all cases of Morgagni hernias (MH) and although there is no agreed on surgical treatment, minimally invasive techniques such as laparoscopy and thoracoscopy are often used. These right sided hernias allow for the herniation of abdominal contents through the thorax. Individuals with Morgagni hernias are usually asymptomatic but may present with non-specific pulmonary symptoms.

Two patients presented with non-specific pulmonary symptoms. A CT scan on both patients revealed a Morgagni hernia with mediastinal shift and bronchial compression. Preoperative pulmonary function tests showed restrictive patterns and reduced spirometry results. A minimally invasive repair method was used which combined an abdominal and thoroscopic approach. Follow up post-operative tests showed improved FVCs and FEV1s for both patients.

Due to the rarity of this condition, we present this case to provide a combined approach that seeks to use a noninvasive method to repair a Morgagni hernia while improving lung functioning through lung recruitment maneuvers.

INSULIN RESISTANCE: RESULT OR CAUSE OF TYPE 2 DIABETES?

Authors: Perice Manns and Walter J. Pories

Background:

Insulin is the most widely prescribed medication for type 2 diabetes mellitus (T2DM) in the world, even though patients with T2DM are hyperinsulinemic, with fasting insulin levels sometimes nine times higher than seen in metabolically normal patients. The reason given for this approach is to “overcome insulin resistance”.

Objective and Method:

The purpose of this review is to present the data from bariatric surgery and explore the literature to assess health outcomes associated with the use insulin therapy in the treatment of T2DM. In addition, we reviewed data obtained during studies done at ECU on patients prior to and after bariatric surgery.

Results:

Our studies in patients who have undergone bariatric surgery with rapid, full and durable remission of T2DM document showed that even though glucose and insulin levels return to normal, with the full resolution of T2DM, insulin resistance remains high.

Conclusion:

These data suggest that the use of insulin in T2DM, a hormone that is a mitogen and causes storage of lipids, deserves serious evaluation.

Angiotensin-II and Its Role in Severe COVID-19 Pathology Mechanisms

By: David Meyer

The COVID-19 pandemic has generated a global health crisis that has impacted virtually all aspects of life. It is understood that viral pneumonia, acute respiratory distress syndrome (ARDS), and disseminated intravascular coagulation (DIC) are primary outcomes of severe COVID-19 infections. While these disease pathologies are recognized, the mechanisms driving these disease states are less understood. Additionally, as hospitalization rates continue to rise for patients with severe COVID-19 infections, there is increasing demand to discover viable pharmaceutical interventions to treat these pathologies. The objective of this literature review is to determine the role angiotensin-II cytokines play in the pathology of severe COVID-19 infections and how targeting this proinflammatory marker pharmaceutically may aid in the reversal of severe COVID-19 symptomology. Literature for this review was collected via self-driven research, in addition to resources provided by Dr. Paul Cook and Jamie Wigent.

According to the literature, angiotensin-II cytokine plays a complex role in the inflammatory response associated with COVID-19 infections. It is hypothesized that the ACE2 receptor of endothelium serves as a viral entry receptor for COVID-19 (similar to SARS-CoV). Once the virus attaches ACE2 receptors and infects endothelial cells, the infected cells, that under normal conditions express angiotensin-I, revert their cellular mechanisms and express increasing levels of angiotensin-II. As levels of angiotensin-II increase, this cytokine antagonizes the endothelial Tie2 receptor and subsequently antagonizes angiotensin-I. This source of competitive antagonism, driven by angiotensin-II cytokines, activates a cascade of pro-inflammatory effects leading to impaired gas exchange, endothelial permeability, and other pro-inflammatory cellular mechanisms. These pro-inflammatory effects are the source driving symptomology of viral pneumonia, ARDS, and DIC seen in potentially fatal severe COVID-19 infections.

From the literature, it can be concluded that the pro-inflammatory cytokine angiotensin-II plays a significant role in pathology associated with severe COVID-19 infections. Based on this understanding, it is conceivable to believe that pharmaceutical interventions aimed at reducing angiotensin-II levels could diminish the ensuing inflammatory cascade. It is important that future pharmaceutical research focuses on targeting angiotensin-II in the treatment of severe COVID-19 infections, but also targeting other markers throughout the pro-inflammatory cascade given the complexity of these disease pathologies.

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Beverage intake in treatment-seeking obese children in eastern NC using the validated BEVQ-15

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Background: Excess caloric intake is a major etiological factor in the onset of childhood obesity, with sugar sweetened beverages (SSB) being a major source of these calories. However, current assessment of SSB intake collects limited information to help target intervention. The beverage intake questionnaire (BEVQ15) assesses frequency, amount (ounces), and caloric energy from SSB consumption in a 3-5 minute assessment that allows for a more detailed evaluation.

Objective/Hypothesis: To examine drink patterns among treatment-seeking children who present to the pediatric weight management clinic in eastern NC, using the validated BEVQ15.

Methods: A retrospective chart review included patients completing a first visit at the East Carolina University Comprehensive Healthy Weight Clinic (CHWC) in 2019. Data collected included sex, age, race/ethnicity, body mass index (BMI), height, weight, zip code, county, preferred language, and insurance coverage (Medicaid vs other). Habitual beverage consumption was assessed by collecting beverage subtypes and average ounces consumed in all patients at baseline via the BEVQ15. Descriptive analyses were conducted to assess total intake of beverage types.

Results: Preliminary results available from January-April 2019 included 79 participants, of whom 56% were female, 58 Black, 10% were White, and 19% were Hispanic. Mean BMI was 32.3 ± 7.3 kg/m² and BMI z-score was 5 ± 1.7 . Mean drink calorie intake of SSB and 100% juice was 417 kcal/day \pm 385 with subtypes as follows: 100% juice 113 kcal/day \pm 154.5; juice flavored drinks, 132 kcal/day \pm 171; soda, 74 kcal/day \pm 103; sweetened tea 33 kcal/day \pm 70; and sports and energy drinks, 28 kcal/day \pm 62.

Conclusion: On average, drink intake is high from 100% juice and juice-flavored drinks compared to soda and sweetened tea. The results from the BEVQ15 can be used with BMI to target key areas for intervention, such as focusing on reducing consumption of juice-flavored sweetened drinks. When data collection is complete, analyses will be conducted to assess association with intake patterns and for change in intake and BMI measures over time with intervention.

Prescription of opioids, non-steroidal anti-inflammatory drugs at a U. S. Dental School.
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Abstract

Background/problem:

Opioid and non-steroidal anti-inflammatory drugs (NSAIDs) are commonly prescribed for pain management. The misuse of opioids can lead to overdose, addiction and in worst case scenarios death; whereas NSAIDs have many potential adverse health effects. In 2017, the US Department of Health and Human Services declared the opioid crisis a public health emergency. Dentists play a crucial role in prescribing these medications for post-dental procedures; by understanding the pattern of how analgesic medications are prescribed, we can have a better approach and overall understanding on how to manage the opioid crisis.

Hypothesis/Objectives:

We hypothesize the data will show a high frequency of analgesic medication prescription for patients across ECUs dental school network clinics. We also anticipate that the prescription of opioids will be decreased after 2017.

Methods:

In this observational retrospective study, data will be obtained from patients who were prescribed either opioids or NSAIDs at ECU Ross Hall or at one of the networked rural dental clinics over a monitoring period of almost 9 years. The data will include patient's demographic, self-report medical history, dental procedures related to the prescription and reason for prescription.

Data will then be analyzed through descriptive statistics.

Results:

9341 patients were prescribed either opioid or NSAIDs, about 4 out of 5 were opioids with Vicodin (52%) being the most prescribed; 1 out of 5 were prescribed NSAIDs with Ibuprofen (91%) the most prescribed. Female patients (54%) and non-Hispanic white patients have high frequency of being prescribed. Prescription of both groups of medications was mainly immediately post-treatment. D7000s CDT (current dental terminology) codes (oral surgery) were the highest distributed procedures. The frequency of the both analgesic medications prescription has been declining after 2017.

Conclusion:

There is a declining in prescription of opioids after 2017. This study has shown that SoDM clinics are responding to the opioid crisis effectively and timely.

Exploring Probiotic Use After Roux-en-Y Gastric Bypass

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Background:

Roux-en-Y Gastric Bypass is currently the most effective treatment for morbid obesity, type 2 diabetes, and other expressions of metabolic syndrome. Through rearrangement of the foregut to decrease contact between food and the gut, this operation significantly impacts weight loss, metabolic activity, and microbial balance in the gastrointestinal tract. In patients who experience nutritional deficiencies, impaired immunity, and gastrointestinal symptoms following surgical intervention, probiotic utilization may offer a new approach to mitigating these late complications.

Objectives: To summarize existing literature on obesity related intestinal microbial alterations in the gastrointestinal microbiome, review effects of bariatric surgery on bacterial imbalance, and examine the efficacy of probiotic use following surgical intervention in treating late complications.

Methods: A literature search of experimental studies was performed in PubMed database with the MeSH terms: “probiotics,” “gastric bypass,” and “bariatric surgery,” along with conceivable synonyms. Additional keywords relating to the “gastrointestinal microbiome” were used to maximize sensitivity, and reference lists of included studies were hand searched to identify additional articles.

Results: Probiotic utilization after Roux-en-Y Gastric Bypass may reduce gastrointestinal symptoms, improve micronutrient status, more fully restore microbial balance, and potentiate weight loss in bariatric surgical patients. Studies support the efficacy of probiotic use post-surgically, but effects may not last. There is still a paucity of information about the types, proportions, phenotypic alterations, and strain specific roles of intestinal microbes in health and disease.

Conclusion: The role of the gut in the development of metabolic syndrome remains to be explained. Although bariatric surgery is remarkably successful, it can result in gastrointestinal discomfort, nutritional deficiencies, and failure to achieve adequate weight loss. Targeted probiotic treatment following bariatric procedures may improve late complications by further restoring intestinal microbial balance. Additional research is needed to clarify phenotypic microbial alterations before and after bariatric surgery.

Infective Endocarditis of a Prosthetic Pulmonary Valve caused by *Mycobacterium Abcessus*

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Infective endocarditis caused by *Mycobacterium abcessus* is rarely reported but most cases are seen in patients after a valve replacement. Infection of the pulmonic valve is the rarest valvular pathology of endocarditis and is usually secondary to a prosthetic pulmonary valve. Infective endocarditis can often times be masked by a myriad of other symptoms and pathologies making diagnosis difficult without positive blood cultures and visualization of valve vegetations. *Mycobacterium abcessus* is resistant to standard anti-tuberculosis drugs and other antimicrobials used against other non-tuberculous mycobacterium. This coupled with a difficult diagnosis of endocarditis presented in a 54 y/o male patient as a series of reoccurring deep sternal wound infections (DSWI) with a negative acid fast stain after a redo open sternotomy for a 2x coronary artery bypass graft. During this initial procedure a prosthetic valve was implanted after iatrogenic injury to the pulmonary valve. The patient underwent multiple sternal wound debridements throughout four hospital readmissions due to infection. The patient was placed on antibiotics but to no avail because the patient was continuously readmitted due to recurrent DSWI's and sepsis. Eventually, the prosthetic valve replaced with a homograft and cultures of a pseudoanersym and the prosthetic valve along with the patch showed acid fast staining indicative of endocarditis caused by *Mycobacterium abcessus*. The patient was started on an antibiotic regiment specific for multi-drug resistant mycobacterium. Visualization of pulmonic valve vegetations can be challenging with both transthoracic and transesophageal echocardiography due to the anterior positioning of the pulmonary valve. Recent studies show positron emission tomography-computed tomography imaging may hold promising prognostic value.

Payment Method and Patient Demographics Determine Type of Dental Services Utilized

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Chronic dental diseases such as dental caries are among the most common chronic preventable diseases affecting children and adults in the United States; but while many people enjoy easy access to dental treatment to treat conditions like dental caries, various socio-economic groups are underserved by dental care providers.¹ Previous studies have identified underserved populations across the globe including racial and ethnic minorities, males, disabled persons, low earners, poorly educated, rural populations, and uninsured individuals.²⁻⁵ This study aims to observe the patterns of specific service utilization among the various underserved groups in the state of North Carolina. Data recorded for 534,983 procedures from 2011-2020 was extracted from the axiUm database containing records from ECU-owned clinics across the state of North Carolina.⁶ Patient health records were analyzed using IBM SPSS statistical analysis software. Patient records were analyzed as by visit and cross tabulation of dental service utilization by personal characteristics and payment method was performed. Disease burden and dental need were measured through DMFT score. Dental service utilization was broken down into specific categories by the number of persons receiving specified treatment types. Method of payment was determined to be related to individual characteristics including location of service, age, race, and dental need. Method of payment plays a role in the determination of the dental service type utilized by an individual. Medicaid payers were more likely to receive restorative work, removable prosthetics, or oral surgery. Whereas, privately insured or self-paying individuals saw a greater variety of service options, and more attractive procedure options like endodontics, periodontics, fixed prosthodontics, implants, and more. Adults 65+ and patients with a demonstrated dental need (DFMT >0) demonstrated a higher likelihood to self-pay, indicating a lack of coverage for this population. In the interest of providing care to underserved populations in North Carolina, policy makers may wish to expand coverage for individuals with a demonstrated need as well as adults 65+, many of whom currently lack insurance options. Further work will analyze these procedures at the patient level, allowing for proper cross-analysis of personal attributes like race, gender, age, location, and other factors.

Rural employment of health care workers: A longitudinal cohort study

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The shortage of healthcare workers in rural areas is a point of concern for policy makers and employers. This study sought to identify characteristics predictive of a career working in rural healthcare. The data for the study was taken from the National Longitudinal Survey of Youth, 1979 cohort (NLSY79), a nationally representative survey sponsored by the U.S. Bureau of Labor Statistics. Respondents who worked in a health occupation after their highest level of education were selected for the study. Multinomial regression analysis indicates that the best predictor for whether a healthcare professional works in a rural area is if they were raised in a rural area. Rural healthcare workers were found to be more likely to have less than a college education. The study also found that there is a significant population that exhibits circular migration between rural and urban settings over the course of their careers.

CBCT Analysis of Vertical Soft Tissue Thickness Before Dental Implant Placement and Its Relationship with Cortical Bone Thickness

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Background: The use of dental implants to support prostheses is a widely accepted treatment modality of high success and predictability. There are many factors that could affect alveolar bone stability around implants, one of them is soft tissue thickness. Vertical soft tissue thickness could be an important factor that affects the crestal bone level around implants. It would be helpful for clinicians to know the normal range of vertical tissue thickness and if it is related to cortical bone thickness, so that better implant treatment plans could be offered to patients.

Objective: The research will measure pre-implant placement CBCT images and study if there is any correlation between cortical bone thickness and vertical soft tissue thickness.

Hypothesis: The primary hypothesis of the study is majority of people have thick vertical soft tissue (>3mm). Secondary hypothesis is vertical soft tissue thickness is positively correlated to cortical bone thickness.

Materials and Methods: Partially edentulous adult patients, who had a CBCT taken before implant placement and that were treated with single implant supported crown at the Comprehensive Care Clinic of ECU SoDM, will be deidentified. Cross-section CBCT image at the center of each edentulous site will be measured using Invivo 6.0.3 software. Data will be tested using SPSS.

Results: The study included 112 patients with a mean age of 58. Female to male ratio was 1.11. Mean vertical soft tissue thickness of the whole sample was 2.13 mm (± 0.75). Mean thickness of cortical bone at alveolar crest was 0.87 mm (± 0.55). Thickness of buccal and lingual cortical plate 5 mm apical of alveolar crest was 1.13 mm (± 0.74) and 1.56 mm (± 0.70) respectively. Width of alveolar ridge at the same level was 9.29 mm (± 2.69). No significant correlation was found between vertical soft tissue thickness and cortical bone at alveolar crest ($r=0.094$), buccal plate ($r=-0.025$), lingual plate ($r=-0.083$), and width of alveolar ridge ($r=-0.032$).

Conclusion: The vertical soft tissue of edentulous sites was found to be relatively thin (<3 mm) overall. Hence, for most patients, vertical soft tissue augmentation may be needed when placing implants. The correlation between hard tissue thickness and vertical soft tissue thickness was generally not significant.

Title

Steroids, Thiamine and Ascorbic Acid Supplementation in Septic Shock (STASIS)

Authors

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Septic shock, a form of distributive shock, is one potential complication of the host immune response to an underlying overwhelming infection and creates devastating health burdens worldwide.¹ There have been few advancements in the management of septic shock beyond antibiotic therapy, fluid resuscitation, vasopressor therapy and stress-dose steroid therapy.² Recent literature suggests a synergistic benefit in the treatment of septic shock using steroids, thiamine and ascorbic acid supplementation (STASIS), indicating their combined low risk and accessibility as potential benefits.³ Based on these findings, we hypothesize that septic shock patients, as defined by the SEPSIS-3 criteria, who are treated with steroids, thiamine and ascorbic acid supplementation will demonstrate a lower 28-day mortality rate than those who received the current standard of care. In this retrospective chart-review the 28-day mortality rate of 72 septic shock patients who received corticosteroids, ascorbic acid and thiamine supplementation was compared to 71 septic shock patients who only received the current standard of care with or without corticosteroids. Secondary outcomes were measured to assess improvements in illness and hospital stay metrics. Septic shock patients treated with steroids, ascorbic acid and thiamine did not demonstrate a lower 28-day mortality rate. However only 6.9% of STASIS patients experienced delirium while 12.5% of non-STASIS patients experienced delirium with statistical significance ($p=0.01$). STASIS patients were more likely to receive a blood transfusion, require a longer Intensive Care Unit (ICU) stay, mechanical ventilation and were prescribed a higher number of vasopressors. There was no significant difference in amount of resuscitation fluids, net fluids at the end of the ICU stay and the need for renal replacement therapy. The global incidence of sepsis is estimated at 15 to 19 million cases each year and continues to increase.^{1,4} STASIS offers a potential treatment to decrease certain risks amongst septic shock patients, while being widely available to patients. As other studies have concluded that neurologic dysfunction is an indicator of poor outcomes in sepsis patients, our finding that STASIS patients are less likely to experience delirium suggests the need for further investigation of the benefits of steroids, thiamine and ascorbic acid.⁵

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TITLE: Efficacy of NC STOP Act in Reducing Opioid Prescriptions in Mandibular Fractures

AUTHOR: Joshua Scarcella, BS, Caitrin Curtis, BS, Chelsea Viscardi, MS, Richard Zeri, MD, Karen Buckley, MD, Yifan Guo, MD

BACKGROUND: Drug overdose is the number one cause of accidental death in the United States with 67,367 deaths in 2018. Opioids were involved in 46,802 of those deaths in 2018 (69.5% of all drug overdoses) and all states have passed legislation to combat the opioid epidemic. On January 1st, 2018, the Strengthen Opioid Misuse Prevention (STOP) Act was implemented in the state of North Carolina in an effort to heighten regulations on opioid prescriptions.

OBJECTIVE: Did Implementation of the NC STOP Act lead to a reduction in opioid prescriptions in mandibular fractures?

METHODS: This is a retrospective chart review of patients who underwent mandibular fracture repair at a single level 1 trauma center between August 2015 to November 2019. Patients were excluded if they sustained multi-system trauma or had greater than 48 hours of inpatient stay. Patient demographics, surgical interventions, and postoperative course were reviewed. The North Carolina Controlled Substances Database was reviewed to quantify both preoperative and perioperative (within 30 days of surgery) prescriptions filled in morphine milligram equivalents (MME). Mean MME per patient was compared between before and after implementation of the STOP Act. Subgroup analysis was conducted on patients who underwent maxillomandibular fixation (MMF) or open reduction internal fixation (ORIF).

RESULTS: Of the 92 patients who met the inclusion criteria there were 51 in the before group and 41 in the after group. While there was a 32% decrease in opioids dispensed per patient overall, this did not lead to a statistical difference ($p=0.19$). The ORIF and MMF subgroups displayed 24.5% ($p=.39$) and 65% ($p=.11$) decreases respectively. The percentage of patients who received opioid prescriptions equal to or greater than 300 MME was higher before the STOP Act relative to after it was enacted (57% vs 38%).

CONCLUSIONS: After implementation of the STOP Act, there has been a decrease in the amount of opioid prescriptions related to mandibular trauma. Although the difference was not statistically significant, it does however, suggest that the STOP Act may be effective in decreasing the volume of opioid prescriptions. Further studies should be considered of multi-center studies and with larger patient populations.

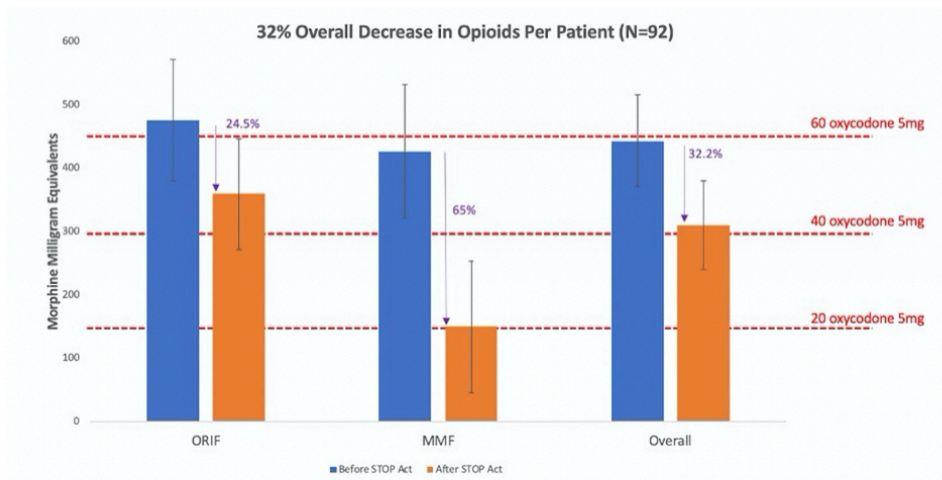


Figure 1. There is an overall 32% decrease in opioids per patient after the STOP Act was enacted. Decreases of 24.5% and 65% were observed in ORIF and MMF subgroups, respectively.

Cardiac toxicity in patients with lung cancer receiving thoracic radiotherapy and immunotherapy

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Background/Objective

Immune checkpoint inhibitor (ICI)-related cardiotoxicities are relatively rare, but can be fatal. The cardiotoxic profile of ICIs combined with radiotherapy is currently not well-defined. Here, we assessed the relationship between cardiac radiation and risk of cardiotoxicity in lung cancer patients treated with combined ICI and thoracic radiotherapy.

Methods

Retrospective data was collected on Stage III-IV small-cell lung cancer (SCLC) and non-small-cell lung cancer (NSCLC) patients who received ICIs between 2015 and 2018 at our institution. Cardiac toxicity associated with ICI was assessed by a cardiologist, and correlated to factors including the history of thoracic radiotherapy (RT), the timing of RT in relation to ICI, and the mean RT heart dose, with multivariate analysis on multiple logistic regression including the Framingham risk score and steroid use at ICI.

Results

Of 194 ICI-treated patients, 22 patients (11.3%) developed cardiotoxicity. Of 107 patients who received thoracic RT, 13 patients (12.2%) developed cardiotoxicity versus 9 (10.3%) out of 87 patients who did not receive thoracic RT ($p=0.87$). All 38 patients who received concurrent RT with ICI did not develop cardiotoxicity compared to cardiotoxicity in 22 out of 156 patients (14.1%) who did not receive concurrent RT ($p=0.030$). There were no significant differences in mean heart RT dose, Framingham risk score, and steroid treatment between patients that received concurrent RT with ICI versus non-concurrent RT/ICI. In a multiple logistic regression model, steroid treatment was independently predictive of cardiotoxicity ($p<0.001$) and the lack of concurrent RT/ICI approached significance ($p=0.055$).

Conclusion

No cardiac events associated with ICI occurred in patients who received thoracic radiotherapy concurrently with ICI. Thoracic radiation could potentially have a cardioprotective effect when given during ICI. The potential cardioprotective effect of thoracic RT given during ICI needs to be investigated further in a larger cohort study, and the underlying molecular mechanisms of this effect needs to be explored using basic models.

Vitamin D Deficiency in Emergency Department Patients with Generalized Complaints

Abdulazeez Swaiti- MD Candidate Brody School of Medicine Class of 2023
Kori Brewer, Ph.D.

Abstract

Background

Vitamin D deficiency has been proven to play an underlying role in multiple known disease states with symptoms ranging from fatigue and weakness to depression and cognitive impairment. However, in Emergency Department (ED) patients presenting with generalized, non-specific complaints/symptoms, Vitamin D levels are not regularly evaluated.

Objective

The objective of this observational study was to describe the ED course and determine if an association exists between diagnosed vitamin D deficiency and particular, generalized chief complaints in Emergency Department patients with multiple ED visits for the same complaint.

Methods

This study was a retrospective chart review including patients presenting to the ED who were billed for three specific ICD.10 codes. The codes we used for this query were E55.9 (Vitamin D Deficiency, unspecified), F41.9 (Anxiety Disorder, unspecified), and R52 (Pain, unspecified). From this study sample we selected 50 random charts (11 E55.9, 19 F41.9, and 20 R52). For each of these charts, we reviewed data regarding the patients' chief complaint, the labs/procedures ordered during these patients' stay in the ED, the duration of their ED visit, if they had previously been diagnosed with a vitamin D deficiency, and whether or not they were admitted into the ED for the same issue within 12 months prior of the original encounter.

Results

Of the 11 E55.9 patients, there was a median of 12 tests performed per patient (range 5-22) and 36% of patients had been to the ED more than once with the same complaint. Four of these patients had psychiatric complaints. All of the patients with psychiatric complaints had at least 1 previous visit for the same complaint, showing a significant association between a complaint of psychiatric nature and repeat ED visits ($p=0.02$). Across all diagnoses, 30 patients had a known vitamin D deficiency and 37% (11) of those had previous ED visits for same complaint, indicating a significant association between having repeat visit for same general complaint and vitamin D deficiency (chi-square $p=0.04$).

Discussion/Conclusion

Diagnosed Vitamin D deficient patients had significantly more tests ordered than pain or anxiety patients. Testing for vitamin D early in patients with generalized complaints may identify a potential source of the problem which can allow for corrective intervention earlier in the therapeutic complaints and ultimately reduce return visits for the same complaints. These findings suggest a need for a prospective study to further explore these associations.

Bariatric surgery reverses cardiac morphology and metabolism to reduce cardiovascular disease burden

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Background: Cardiovascular disease remains a major burden in the U.S., with over 48% of adults having a form of cardiovascular disease in 2019. One of the major risk factors for cardiovascular disease is obesity, which contributes to cardiac remodeling in the ventricles and cardiac myocytes, often leading to cardiac dysfunction and heart failure.

Question: Bariatric surgery, which is used to help morbidly obese patients achieve considerable weight loss, leads to a decrease in cardiovascular disease events, begging the question of whether this is due to the weight loss or a reverse in cardiac remodeling?

Methods: The current literature in PubMed was reviewed by using a refined search with MESH terms and related key words to help narrow down the relevant literature to the topic. The filters used in the search were articles within the past 10 years, English, and free full text.

Results: The review of the literature showcased that bariatric surgery is associated with a reversal of the mass, volume, and shape of the left ventricle and cardiac myocytes of patients. A metabolic overview of the impacts of the surgery in rats indicated an increased expression of insulin signaling proteins, producing a decrease in insulin resistance. Increased Ca^{2+} levels and myocardial Ca^{2+} regulatory proteins were observed in the cardiac myocytes of these rats. Our studies in cultures of human striated muscle suggest that the changes occur in the mitochondrial membrane with improvement in metabolic efficiency at the entry of fatty acids and glucose into the TCA cycle.

Conclusions: The findings of this review indicate the beneficial impacts of bariatric surgery and potential mechanisms of how it helps alleviate cardiovascular disease risk. These findings can be further investigated and studied in humans to see if this surgery and how it impacts cardiac metabolism and remodeling can be used on patients that do not qualify for the surgery under its current criteria.