Student Scholarly Project Presentation Day

JANUARY 16, 2024

Tilman J. Fertitta Family
College of Medicine

UNIVERSITY OF HOUSTON

Program

TILMAN J. FERTITTA FAMILY
COLLEGE OF MEDICINE - ALC 1200
UNIVERSITY OF HOUSTON
JANUARY 16, 2024

PROGRAM STRUCTURE

The SSP is an in-depth, mentored learning experience. Projects should be in an area of personal interest and include a testable hypothesis. As a result of completing this project, students will be able to think critically, explore beyond the curriculum to investigate problems in more depth, ask and answer important questions, and work with a team of scholars. This project will be an opportunity for self-directed learning and integrate multiple curricular domains including professionalism, ethics, communication, research methods, epidemiology, biostatistics and biomedical sciences. The course culminates in an abstract and poster presentation allowing students to disseminate their research findings and obtain experience in the scientific process.

GOALS

1. Foster intellectual challenge and a spirit of inquiry within the College of Medicine
2. Provide the skills needed for lifelong learning and continuous quality improvement
3. Provide instruction in the scientific method and the basic scientific and ethical principles of clinical and translational research, including the ways in which such research is conducted, evaluated, explained to patients and applied to patient care

About the Judges

ZUHAIR ALI, M.D.

Zuhair Ali, M.D. is our Research Director for Graduate Medical Education in the Gulf Coast Division. In partnership with our Program Directors, he is responsible for maintaining ACGME accreditation for programs within our division by creating and executing the scholarship agenda for residents and fellows. This entails faculty development on topics relating to the research lifecycle, mentoring faculty and learners in scholarship, and developing research opportunities with various partners such as Quality departments internally, and with University of Houston College of Medicine externally. Ali comes to us with many years of experience managing and participating in clinical research for graduate medical education programs. Prior to joining Health Corporation of America, he was the research director at New York Presbyterian, directly supporting the Emergency Medicine service line, with involvement supporting other programs' clinical research agenda such as cardiology, hematology, and oncology. Ali completed his medical training at St. Christopher's Iba Mar Diop College of Medicine, and received additional research training from Harvard Medical School Global Clinical Scholars Research Training Program.

MARINO BRUCE, PH.D., MSRC, M.DIV.

Marino A. Bruce, Ph.D., MSRC, M.Div. is a sociologist and population health scientist who examines the full range of factors, including faith, religion, and spirituality, that influence cognitive and physical functioning among Black males over the life course and across generations. He is Associate Dean for Research and clinical professor in the University of Houston Tilman J. Fertitta Family College of Medicine. Bruce has been funded by the National Institute of Health for nearly three decades and has published more than 110 peer-reviewed articles and book chapters. He is co-editor of two books, Men's Health Equity and Racism: Science and Tools for the Public Health Professional, editor of Research in Race and Ethnic Relations, and associate editor for Ethnicity and Disease. Bruce is also an ordained Baptist minister and his current work leveraging professional, educational, and clerical experiences has been featured on numerous global media outlets including USA Today, The Today Show, US News and World Report, and Time Magazine. He earned a bachelor's degree in Economics from Davidson College and master's degrees in Rural Sociology, Divinity, and Rehabilitation Counseling from North Carolina State University, Piedmont Theological Seminary, and Winston Salem State University, respectively. Bruce earned a Ph.D. in Sociology from North Carolina State University and received postdoctoral training in Family Medicine from the University of Wisconsin-Madison and in Biobehavioral Health from Duke University.

CLAUDINE JOHNSON, M.D.

Claudine Johnson, M.D. is a clinical associate professor at the Tilman J. Fertitta Family College of Medicine and an internal medicine physician practicing primary care. She leads the 4-year Household Centered Care program, which is an interprofessional, service-learning experience for medical, nursing and social work students. Johnson earned her bachelor's degree in Economics from Harvard University and her medical degree from Weill Medical College of Cornell University. She completed internal medicine internship and residency at Medical College of Virginia in Richmond, VA and University of Texas Medical Branch in Galveston, TX, respectively.

Johnson is a native New Yorker and married with two children. She is an active member of Delta Sigma Theta Sorority, Inc. and Jack and Jill of America, Inc, and dedicates her spare time to serving her community.

BEN KING, PH.D., M.P.H.

Ben King, Ph.D. M.P.H., is a clinical assistant professor at the Tilman J. Fertitta Family College of Medicine. He is responsible for analytical support of the department's program evaluations and teaching evidence-based medicine and other quantitative methods. In addition, he is a statistician with the Humana Integrated Health Sciences Systems Institute at UH.

King's work focuses on the design and support of programs to help the most vulnerable and disadvantaged in the community. His experience includes managing and analyzing large clinical datasets, community-based studies of health disparity, and clinical trials in acute and emergency care settings.

He is passionate about issues related to ending homelessness and serves on the National Health Care for the Homeless Council's Research Committee. He also served as the past chair of the American Public Health Association's Caucus on Homelessness from 2009 to 2016.

Previously, King worked as a research scientist in the Neurology Department of the Dell Medical School and taught in the undergraduate public health program at the University of Texas at Austin. While there, he helped launch multiple research programs across medical specialties in neurology, emergency medicine, psychiatry, and family medicine.

King has a bachelor's degree in neuroscience from Bard College. He earned a master's degree in public health and a doctorate in epidemiology from the UTHealth School of Public Health.

STEPHEN J. SPANN, M.D., MBA

Stephen J. Spann, M.D., MBA, a family physician leader, educator and researcher, is the founding dean of the Tilman J. Fertitta Family College of Medicine and vice-president for Medical Affairs at the University of Houston. Spann has dedicated his career to improving health and health care around the world by training future health care professionals, contributing to the scientific knowledge base of primary care and by leading medical school faculty, physician medical groups and hospital staff to practice high-quality, evidence-based family medicine.

Spann has been active in the development of the specialty of family medicine in the United States and abroad. He has served as a member of the Commission on Public Health and Scientific Affairs, the Task Force on Clinical Policies, and as member and chair of the American Academy of Family Physicians' (AAFP) Commission on Clinical Policies and Research and its Task Force to Enhance Family Practice Research. He served as a member of Task Force 1, and chaired Task Force 6 of the Future of Family Medicine Project, focusing on the development of the New Model of Family Medicine practice — now known as the Patient-Centered Medical Home — and the development of financial models to predict its success. He served as the lead consultant to the AAFP planning process to develop a national practice resource center to support the implementation of the New Model of Family Medicine, resulting in the development of Transformed, a subsidiary of the AAFP. Spann has served as a consultant to medical schools, residency programs, ministries of health, and health care delivery systems in many countries, focusing on primary care training programs and clinical practice development and implementation.

Prior to joining University of Houston, from late 2012 to 2015, Spann served as chief medical officer of Tawam Hospital, a 460-bed tertiary care teaching facility in Al Ain, United Arab Emirates, which is managed by Johns Hopkins Medicine International, and as senior advisor on primary care and academic affairs to SEHA, the Abu Dhabi Health Services Company. Previously, he served as chairman of the Department of Family and Community Medicine at Baylor College of Medicine from 1997 to 2012 and as Baylor's senior vice-president and dean of clinical affairs from 2008 to 2010. Before joining Baylor, Spann was chairman of the Department of Family Medicine at the University of Texas Medical Branch in Galveston, Texas from 1990 to 1997, a member of the faculty and vice-chairman of the Department of Family Medicine at the University of Oklahoma College of Medicine from 1982 to 1990, and a member of the voluntary clinical teaching faculty of the Department of Family Medicine, Wake Forest Bowman Gray School of Medicine from 1979 to 1982. Prior to entering full-time academic medicine, Spann spent four years practicing rural family medicine in Arkansas and North Carolina.

A graduate of Baylor University and Baylor College of Medicine, Spann completed his residency training in Family Medicine at Duke University Medical Center and received an MBA degree from the University of Texas at Dallas. He and his wife Nancy have two married children and four grandchildren who live in Texas.

NATARAJAN VENKATAYAN, M.D.

Natarajan Venkatayan, M.D., is a clinical associate professor in the Department of Clinical Sciences at the Tilman J. Fertitta Family College of Medicine. Venkatayan completed his medical degree in India and his residency in family medicine in New York. He has three years of post-doctoral research training in UMDNJ- Newark before joining the residency program.

In 2006, Venkatayan moved to Texas and started his career in rural Texas with a passion to help underserved communities. He has served in the capacity of medical director at the correctional facility and at HHSC, a state supported living center. It was here that he acquired leadership skills and enriched medical knowledge to compassionately serve the needs of the broader society.

As a primary care physician and clinical educator, with a focus in academic family medicine, Venkatayan advanced his career to a leadership role as program director at Detar Family Medicine Residency Program, which is affiliated with the Texas A & M School of Medicine.

Through his many leadership roles, Venkatayan has cultivated an ardent passion for educating residents and medical students. He currently serves as the program director of the Family Medicine Residency Program - HCA Houston health care West; training future generations of health care professionals and contributing to their medical knowledge in primary care.

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FACULTY MENTORS

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INDIVIDUAL CONTRIBUTORS

- Aaron Lara
- Monica McKey
- Leslie Rojas
- Katelyn Velez

Schedule

OPENING REMARKS 1:00 P.M. - 1:15 P.M.

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CLOSING REMARKS & AWARDS **3:45 P.M. - 4:00 P.M.**

Does Intraoperative Opioid Administration and Postoperative Pain Differ by Patient Demographics?

Authors: A. Milam, M. Youssef, K. Ugochukwu; E. Habermann, E. Brennan, K. Hanson, G. Raynor, S. Porter, M. Harbell, D. Warner

Background: Health care disparities based on race, ethnicity, and socioeconomic status (SES) remain a significant concern, especially in perioperative pain management. Applying a health equity lens, this study investigated intraoperative pain management for four common surgical procedures.

Objectives: The primary objective of this study is to investigate potential disparities in intraoperative opioid administration and postoperative pain outcomes among adult patients undergoing total knee arthroplasty, cholecystectomy, prostatectomy, or hysterectomy.

Methods: A retrospective cohort of 24,737 adult patients who underwent total knee arthroplasty, cholecystectomy, prostatectomy, or hysterectomy between 11/4/2017-2/1/2022 at a single, multi-site, academic tertiary hospital was analyzed. The primary outcome was moderate-severe post-operative pain, and the secondary outcome was morphine milligram equivalents (MME) administered intraoperatively. Independent variables included patient's race and ethnicity, health care payer type, and community-level SES.

Results: There were no differences in perioperative pain score by race and ethnicity in the pooled sample (all 4 surgeries) found with multivariable logistic regression models. Hispanic patients were more likely to be administered the top-quartile of opioid MME (OR = 1.20; 95% CI: 1.09, 1.52) but there were no other differences by race and ethnicity. Patients with Medicare and Medicaid had 16% and 23% higher odds of moderate-severe pain compared to patients with commercial insurance or self-pay, respectively, despite patients with Medicare having higher odds of top-quartile MME (OR = 1.22; 95% CI: 1.11-1.34) compared to non-government insured patients. There were no differences in pain score nor MME by community-level SES.

Conclusion: Our study found few disparities in postoperative pain score and intraoperative opioid administration, adding to the body of literature finding that access to quality hospitals may reduce health care disparities. These findings highlight the importance of applying a health equity lens and stratifying data to ensure equitable surgical care for all patients.

South Texas Young Adult Cancer Survivors: Voices on HPV Vaccination

Authors: G. Sanchez, G. Gutierrez, A. Grimes

Background: Adolescent and young adult (AYA) cancer survivors have a 70% increased risk of developing a secondary HPV-related cancer compared to their peers. Yet, despite this risk, HPV vaccination in AYA cancer survivors remains low compared to the general population (23.8% vs. 40.5%). Confusion persists for patients and providers around patient eligibility for vaccination and when to vaccinate. The South Texas AYA population is of particular interest given the majority Hispanic/Latino ethnicity and disparities in this region regarding access to cancer care, cancer screening and survival outcomes. In this study, we sought to identify patient-level attitudes, beliefs, and behaviors related to HPV vaccination among South Texas AYA cancer survivors through the development and dissemination of a dual language "AYA HPV landscape survey."

Objectives: What attitudes, beliefs, and behaviors among South Texas AYA cancer survivors influence their utilization of the HPV vaccine?

Methods: An electronic REDCap survey was developed to obtain baseline patient-reported information about HPV vaccination among AYA survivors seen Jan-Apr 2023 at Mays Cancer Center, a "Hispanic-serving" NCI-designated cancer center. Eligible participants included those ages 18-45 years previously treated for any cancer with an email address on file. The Multi-Language Management System in REDCap allowed patients to choose English or Spanish versions of the survey which included 23 multiple choice questions with branching logic to guide response-adapted query. Survey content was developed across 3 topic areas: participant demographics, social determinants of health that can impact HPV vaccine access, and HPV-focused questions about risks, education, and motivation about the virus and vaccine.

Results: The survey was distributed via email to 333 participants and 45 surveys were completed (13.5% response rate). Most respondents were females (82.2%) ages 19-45 with a high school education or higher (88.9%). Half identified as Hispanic/Latino (53.3%). Carcinoma was the most common prior cancer type (66.7%) and half were still receiving cancer treatment (51.1%). The majority of participants had no prior HPV vaccine (73.3%), mostly due to no PCP recommendation or uncertainty about eligibility (60.6%). The remaining respondents were HPV-vaccinated females ages 20-45 with health insurance and a PCP (26.7%). Among them, 83.3% received their HPV vaccine series before their cancer diagnosis. Some respondents were aware that the HPV vaccine prevents six cancer types (20%), and only 4.4% received an HPV vaccine recommendation by their PCP or oncologist. A minority of participants believe they are at an increased risk of acquiring an HPV-related cancer (17.7%), with 62.5% of these attributing their increased risk to their previous cancer diagnosis.

Conclusions: HPV recommendation and vaccination is an underutilized survivorship care guideline in the AYA cancer survivor population. Most young adult survivors were HPV unvaccinated (73.3%) and few (<20%) felt they had increased risk for an HPV-driven cancer, providing strong rationale for patient education about HPV-related cancers and AYA cancer survivors' risk. Few respondents were recommended the HPV vaccine by their PCP or providing strong rationale for patient education about HPV-related cancers and AYA cancer survivors' risk. Few respondents were recommended the HPV vaccine by their PCP or oncologist, highlighting needs for provider-targeted interventions to improve vaccination rates. Results of this survey will be used to guide next-step implementation studies targeting improved provider recommendation, AYA survivor education, and uptake of HPV vaccination.

Making Health Care More Affordable: Alternative Approaches to Health Care Finance

Authors: G. Flores, B. King

Background: Prior research on alternative payment models has mostly focused on defining them and looking at case studies at individual hospitals and clinics. By reframing the definitions and studies in the context of federal Medicare and Medicaid spending, we want to see how health care reimbursement operates currently so we can look for areas to improve on. This study aims to definitely answer which alternative payment model is the most effective in achieving the triple-aim and does so most efficiently with federal and state resources, which other studies have not made due to lack of data.

Objectives: The objective of the project was to determine which alternative payment model (APM) provides the most comprehensive care for the least amount of cost, relatively speaking. The project sought to determine which APM provides the best outcomes and is best suited for wide implementation at federally qualified health centers and hospitals nationwide.

Methods: Investigators conducted a thorough literature review. The intervention of focus was studies that compared the APM and reported findings related to our objective measures of quality and cost the best. Our outcomes were which APM provides the best outcomes, the most efficient use of health care spending, and improved provider accountability. The data was provided from peer-reviewed journal articles and studies found on the National Institutes of Health database. The time frame was research completed within the last two decades.

Results: Study results showed evidence that Pay for Performance provided the most significant positive change in health outcomes relative to the amount of money spent. Bundled payments likewise showed promise for larger organizations as a way of providing a middle ground between FFS and Capitation, but more data is needed to make a conclusive recommendation.

Conclusions: Our recommendation would be for the implementation of pay for performance at FQHCs, clinics, and hospitals because the data demonstrates improved patient outcomes and physician performance. It also encourages primary prevention and a robust focus on primary care.

Morphometric Study of Meniscofemoral Ligaments - A Pilot Study

Authors: T. Gray, A. Awazi, S. Wilson, C. Cooper, C. Sadacharan

Introduction: There is a lack of knowledge about the anterior and posterior meniscofemoral ligaments (aMFL, and pMFL) of the knee joint. The aim was to investigate preliminary data on anatomical variations in length, width, and prevalence of aMFL and pMFL.

Methods: After careful dissection of the knees, aMFL and pMFL (bilateral) were studied in 12 dissected cadavers at the Tilman J. Fertitta Family College of Medicine Anatomy Laboratory. Samples with previous history of Osteoarthritis, Total Knee arthroplasty or any signs of tissue degeneration were excluded. Upon flexion of the cadaveric knee, aMFL and pMFL length, and width were measured using calibrated electronic calipers. The prevalence, morphology, and attachment sites of the meniscofemoral ligaments (MFLs) were also recorded.

Objective: To assess whether there are differences in length, width, and origin or insertion between aMFL and pMFL in cadaveric populations.

Results: The pMFL was present in all knees (100%) whereas aMFL is present in 50% of knees. The aMFL was located anterior to the posterior cruciate ligament (PCL), while the pMFL was located posterior to PCL. The aMFL (mean, 5.35mm) was thicker and more robust than the pMFL (mean 4.37mm). The aMFL was longer (28 .1 mm) compared to pMFL (25.49mm).

Conclusion: The aMFL and pMFL might help to stabilize the lateral meniscus of the knee joint. Limited research suggests that aMFL prevalence and intra-articular protrusion may be more anatomically related than previously thought. Correlation analysis of anatomical variations of pMFL in future studies, aMFL may result in larger sample sizes.

Factors Associated with Health Study Participation Among Black Adults: A Multi-Level Perspective

Authors: A. Felix, S. Campbell, D. Cho

Background: Historically, Black adults have been underrepresented in health studies. This underrepresentation causes data to be incomplete when referencing the demographics of a population, neglecting an entire group that could benefit from the facts uncovered in these studies. Researchers have found that the lack of Black adults' participation in health studies can be pointed back to the mistrust of health care providers and/or research studies. Although there is an understanding of some aspects of the lack of engagement in health studies, there is no literature dedicated to analyzing the associations between participants' multiple levels of influence, such as patient-provider relationships, their neighborhood and social environment, and personal perceptions of their own health status and medical care. Taking this multi-level approach will give researchers insight into barriers to Black adults' participation in health studies and their connectedness to their surroundings.

Objectives: This study will examine how the participation of Black adults in health studies is determined by multiple levels of influence, such as patient-provider relationships, their neighborhood and social environment, and personal perceptions of their own health status and medical care.

Methods: The authors will analyze the Project CHURCH (Creating a Higher Understanding of Cancer Research and Community Health) data set to answer the question and gain knowledge of the participants they are working to understand. This data was collected using community-based participatory research principles, to understand disparities in cancer prevention and risk factors for Black individuals. The primary outcome of this study is previous participation in health studies, assessed using a one-item question with a binary response of 'yes' or 'no'. Logistic analyses will be conducted to investigate associations between the primary outcome and factors such as demographics, patient-provider communication, built environment, and social environment.

Results: The authors anticipate finding that Black adults with negative patient-provider relationships, an unsupportive social environment, and poor health will be less likely to have participated in health studies.

Conclusions: The results of this study will provide insights to researchers and health care providers regarding the reasons Black adults may have reservations about participating in health studies. This information, in turn, will contribute to finding ways to include this underrepresented group in research studies on health.

Vibrio Cholerae Virulence Factor Expression

Authors: I. Tejeda, F. Asad, D. Raskin

Cholera is an acute enteric disease caused by the gram-negative bacteria Vibrio cholerae. It can quickly cause a dangerous fluid loss of ~1 liter an hour. Therefore, if left untreated cholera can reach a mortality rate of 25-50%. The two main relevant virulence factors include toxin-coregulated pilus (TCP) and cholera toxin (CT). TCP is essential for intestinal colonization while CT is an A-B toxin responsible for causing its characteristic rice water diarrhea. Previous research has demonstrated that gene expression of these virulence factors is controlled by the ToxR Regulon. The ToxR regulon can be induced by stringent response, a low-nutrient stress response that produces changes in gene regulation. Our current research tested the expression of virulence factors related to CT and TCP, ctxA, tcpA and toxT in stringent response V. cholerae mutant strains. Gene expression of six V. cholerae strains subjected to stringent environment was measured using RT-qPCR. We found a relative reduction of gene expression in stringent response mutants as compared to wild type. Therefore, we can conclude that stringent response plays a significant role in gene expression and regulation of V. cholerae virulence factors, CT, and TCP.

Health Disparities in Access to Quality Hearing, Speech, and Language Care for Children with Sensorineural Hearing Loss who Use Cochlear Implants

Authors: A. Franklin, S. Salazar, F. Bunta

Background: Access to hearing technology as well as to quality speech and language support are critical for individuals with sensorineural hearing loss to reach their full potential. Little is known regarding how demographic factors and speaking a language other than English at home affect young bilingual cochlear implant users in terms of access to communicative interventions and how those factors interact to determine speech and language outcomes in this population.

Objectives: We are investigating how potential health disparities and home language affect access to care as well as speech and language outcomes in children with sensorineural hearing loss who use cochlear implants.

Methods: The present study uses survey data from parents or guardians and recorded speech data from young patients with sensorineural hearing loss who use cochlear implants who are monolingual English-speaking and bilingual Spanish- and English-speaking between the ages of 4 and 8 years from various socio-economic backgrounds.

Results: We predict that home language use and socioeconomic status will have main and interaction effects on access to speech, language, and hearing services. We also predict that speaking a language other than English at home will interact with demographic factors in such a way that speech outcome measures will display larger effects for bilingual children with hearing loss who use cochlear implants compared to their monolingual peers.

Conclusions: Identifying and overcoming barriers to quality hearing, speech and language care are critical to ensure that all children with hearing loss receive appropriate care regardless of their background.

Exploring the Relation Between Power Spectral Density and Behavioral Measures of Speech and Language in Primary Progressive Aphasia

Authors: A. Basquine, A. Cerda, J. Mena, H. Dial

Introduction/Hypothesis: Primary Progressive Aphasia (PPA) is a neurodegenerative disorder characterized by speech and language deficits that worsen over time. There are three different types of PPA: the nonfluent variant (nfvPPA), the semantic variant (svPPA), and the logopenic variant (IvPPA). The variants are categorized according to patterns of speech and language abilities. Each of the variants have specific characteristics for a definite diagnosis, but due to the slow onset of PPA and the overlapping nature of the variant specific diagnostic criteria, it can be difficult to detect PPA and its variants early. In the pursuit of advancing early detection methods for PPA and its variants, researchers are actively engaged in identifying biomarkers with diagnostic potential. In a recent senior honors thesis, Quinn et al. (2023) delved into the analysis of power spectral density-a measure of the frequency content in EEG signals-during resting state EEG in the three PPA subtypes. Notably, distinct patterns of relative power spectral density emerged for each subtype, providing valuable insights into the characteristics of PPA. The current study builds upon the idea that each frequency band correlates to specific neural activity that allows for insight into underlying behavioral tasks.

Objective: To elaborate on the discoveries outlined in a recent senior thesis, we hypothesized that correlations may manifest between distinct frequency bands and the behavioral tasks executed by the study participants. Because each of the PPA subtypes has specific behavioral characteristics, the resting state EEG power spectral density should be related to specific behaviors. This study could potentially help guide the selection of more accurate interventions for patients with PPA based on their resting state EEG power spectral density.

Methods: The study was done to correlate power spectral density from resting state EEG data collected at the University of Texas at Austin's Aphasia Research and Treatment Lab to various behavioral tasks. The study consisted of twenty-two participants with PPA: 10 with lvPPA, 6 with nfvPPA, and 6 with svPPA. The resting state EEG measured the neurophysiological activity of the participants at their scalp by a 32-channel electrode cap in the absence of specific stimuli to measure the brain's intrinsic neural activity.

Results: We observed an inverse correlation between power spectral density in alpha band and the Northwestern Anagram Test and a positive correlation between power spectral density in beta band and the Syntax Comprehension Task.

Conclusion: This exploratory study was conducted to determine whether resting state EEG power spectral density within specific frequency bands was related to behavioral measures of cognitive-linguistic processing. Power spectral density may serve as a valuable tool for investigating the neural dynamics underlying behavior. In the current study, the alpha and beta bands were related to grammatical tasks, but future work should seek to determine the source of the relation between these frequency bands and tasks.

Utilizing Commercial Technology for Pain Sensory Detection: Developing a Predictive Algorithm for Pain Prediction in Nonverbal Individuals

Authors: B. Archer, D. Fayad, T. Manning, G. Tavera, H. Nguyen

Background: The pressing need for accurate, objective pain assessment is underscored as a pivotal element in effective pain management. Current practices such as relying on self-reported 1-10 measures are deemed suboptimal, emphasizing the necessity to develop an objective pain assessment tool. Such a tool would significantly enhance the well-being and care processes, particularly for noncommunicative patients.

Objective: To establish a computational framework for Artificial Intelligence (AI) to create a predictive model for the chronic pain scale, augmenting the conventional verbal pain scale.

Methods: The research was structured to procure biomedical data from postoperative patients exhibiting moderate to high pain levels. 20 participants, aged 20-69 , were systematically enlisted from a physical therapy clinic for data collection. Measurements were acquired via the Empatica watch, which utilizes sensors to monitor physiological indicators such as heart rate, electrical skin conductance changes, and skin temperature.

Results: Preliminary findings reveal a significant correlation between specific physiological markers and self-reported pain levels. Initial analysis suggests that variations in heart rate and skin conductance may serve as reliable indicators of pain intensity. Further exploration of temperature measures is ongoing. These promising results underscore the potential of wearable technology in personalized pain management strategies. Further analysis and a larger sample size are crucial for comprehensive insights.

Conclusion: Pain assessment has traditionally relied on qualitative measures, with limited exploration into quantitative approaches. Leveraging advancements in technology, this study delves into the potential of employing the Empatica watch for pain measurement. Specifically, we examined its application among 20 chronic pain patients during Physical Therapy sessions. Preliminary findings indicate notable skin changes in 10 patients and variations in heart rate in 15 cases. These results, while preliminary, establish a foundation for further investigation with a larger sample size. Exploring this technology promises enhanced patient care by providing valuable insights for health care providers and fostering improved communication between patients and their caregivers. Furthermore, this technological approach holds the potential to mitigate biases through the provision of objective, quantitative measures.

Psychological Safety Between Nurses and Physicians: An Investigation of Pediatric Units

Authors: K. Crouch, M. Vu, I. Gan

Background: Psychological safety is the belief that anyone on a team can speak up without fear of punishment. It fosters collaboration, innovation, and a safe space for communication. This study builds upon previous research evaluating psychological safety, but focuses on pediatric populations. Unlike adult patients who can advocate for themselves, children often have to rely on the coordinated efforts of their health care team. It is our goal to fill the existing gap in literature by investigating possible deficits in pediatrics.

Objectives: To evaluate psychological safety between pediatric nurses and physicians and identify potential conditions, processes, and behaviors that improve communication and patient safety.

Methods: We recruited pediatric nurses licensed in the U.S. to participate in an online questionnaire analyzing health care team dynamics, error reporting and patient safety. Survey responses were graded using the 5 point Likert scale.

Results: A total of 36 nurses participated in the study. 83.3% reported feeling psychologically safe and 86.1% feeling respected by physicians. Participants stated 91.6% of mistakes were reported if they directly affected the patient, but only 69.5% stated mistakes were reported if caught and corrected before reaching the patient. 47.2% of nurses reported 2 or more safety events in the past 12 months and only 61% of nurses rated patient safety as good or excellent.

Conclusions: Our study demonstrated a majority of nurses felt psychologically safe. However, challenges in error reporting and low patient safety ratings suggest areas for improvement. Future research will include interviewing participants about error reporting procedures and patient safety.

Does Living in a Maternity Care Desert in Texas Increase the Likelihood of Inadequate Prenatal Care, C-section Rates, and Low Birth Weight Babies?

Authors: E. Lakey, C. Karr, K. Janda,

Background: Previous studies have shown that rural regions in the US have higher maternal and infant health risks than urban areas. Within Texas, 177 counties are rural, and 71% are considered to have inadequate access to obstetric care. Little is known about the effect maternity care deserts have on prenatal care and infant health; further investigation is needed to determine if Texas counties classified as maternity care deserts have increased maternal and infant health risks.

Objectives: To identify the significance of correlations between maternity care desert status and OB providers/ 10k births, inadequate and late prenatal care, C-section rates, and low birth weight babies.

Methods: Design: Correlational research with Spearmann analysis. To determine the significance of maternal care deserts on pregnancy care and birth outcomes the authors will query the March of Dimes 2020 Report and Texas DSHS Vital Statistics Data (2020). Main and Secondary Outcomes measure: maternity care desert status and OB providers/ 10k births, inadequate and late prenatal care, C-section rates, and low birth weight babies.

Results: Living in a maternity care desert has a very weak negative correlation with inadequate prenatal care, access to prenatal care, and low birth weight babies. There is no significance between living in a maternity care desert and C-section rate.

Conclusions: This study revealed that there is little correlation between solely living in a maternity care desert in Texas and pregnancy care and birth outcomes. More research is needed to identify factors that explain the prevalence of these outcomes in rural areas.

A Qualitative Examination of the Lived Experiences of Black Americans in Opioid Misuse Recovery

Authors: M. Miller, L. Gilbert

Introduction/Hypothesis: Black communities have experienced a 18-fold increase in mortality due to opioid use but are less likely to receive and complete medications for opioid use disorder (OUD) that support the recovery journey. The purpose of this study is to explore the Black American minority experience, specifically within the Houston area, with the opioid crisis through the lens of community members and family members and individuals living with OUD. We hypothesized the Black Americans will have unique needs and priorities regarding treatment for OUD.

Methods: We conducted a series of 31 interviews with self-identified Black American individuals in the Third Ward area of Houston, TX who had experience with opioid use disorder (OUD). Questions were asked to learn more about treatment experiences. A qualitative selective coding approach was used to look for common themes and experiences among the participants using NVivo software.

Results: We specifically examined awareness and experiences with Fentanyl & Narcan, medication assisted treatment (MAT), and barriers to recovery barriers. Participants would actively avoid fentanyl when they were actively using, although several reported direct encounters with fentanyl. Several participants reported knowing about Narcan to reverse overdoses, but few knew about it before treatment or would carry it prior to treatment. Participants were less aware of the availability and utility fentanyl test strips. Participants reported taking either methadone or suboxone as part of their OUD treatment and recovery journey, but there was a preference for suboxone over the stigmatized methadone. Barriers to recovery were also highlighted by participants, including lack of family support and religious perspectives that can hinder the acceptance of engaging in MAT.

Conclusion: In this qualitative research study of lived experiences of Black Americans with OUD, we found continuing gaps in the knowledge of harm reduction strategies within this community with limited awareness of evidence-based strategies. For those engaged in MAT, methadone continues to be stigmatized when compared to buprenorphine. Furthermore, cultural-level barriers exist for Black Americans who are in recovery from OUD. Future outreach and treatment strategies should consider these community-level factors to better address the needs and strengths of this community.

Exploring the Impact of an Educational Seminar on Injury Prevention as well Its Perceived Value among Collegiate Female Athletes

Authors: N. Tchekryguin, L. Harrison

Background: Lower extremity injuries are common amongst collegiate level athletes and can have significant consequences on their athletic performance, career, and overall health. By assessing the baseline knowledge of athletes and providing a comprehensive educational seminar, this study can help identify any gaps in their knowledge and understanding of lower extremity injury prevention. Additionally, we will evaluate the perceived benefit of this seminar and if it has any effect on their confidence of the subject material. The literature demonstrates that female athletes are willing to perform a lower extremity injury prevention program if data indicated they would have fewer injury risk factors and suffer fewer anterior cruciate ligament (ACL) and leg injuries (1). In a separate study conducted among Universiti Teknologi MARA (UiTM) female athletes, the researchers investigated the current level of knowledge of sports injury prevention and management, demonstrating that 82.5% of participants met the knowledge test’s requirements and had a good/consistent attitude towards sports injury prevention and management. They suggested that groups at higher risk of sports injuries, such as college athletes should learn more about sports injury prevention and management. The entire population considered training for prevention of management of sports injuries as highly needed (2). It is transparent that athletes want to continue their activities devoid of injury and will gladly participate in training if available. Furthermore, there is a considerable amount of literature describing lower extremity injuries in athletes, but insufficient data discussing the effectiveness of educational interventions in reducing the incidence and severity of these injuries, or if influences their confidence regarding the subject material.

Objectives: The objective of this study is to evaluate the level of knowledge among a sample of female collegiate level athletes regarding lower extremity injury prevention and management, prior to receiving a comprehensive educational seminar. Subsequently, the effectiveness of the seminar in improving the athletes' knowledge and understanding will be assessed through a post-intervention assessment. Concurrently, we will assess athletes’ attitudes regarding the efficacy of implementing an educational seminar on injury prevention/management and if they believe this will be beneficial to their overall success/confidence.

Methods: We surveyed collegiate female soccer and volleyball athletes before and after a brief educational seminar (BES) composed of epidemiologic data regarding common lower extremity injuries of their respective sports, an overview of anatomical structures, the mechanism of injury, proper treatment protocol, and future injury prevention techniques. This study utilized a quasi-experimental research design, consisting of a pre-test/post test survey which had a mix of Likert-style and multiple-choice questions. Likert-style questions were employed to evaluate athletes’ perspectives on whether attending a sport-specific injury prevention seminar would enhance their athletic careers and long-term health, aid in identifying early warning signs of potential injuries, and boost their confidence in injury prevention and management. The multiple-choice questions contained information relating to the content of the BES. The pre-test and post-test survey contained identical content; however, this information was withheld from participants. The pre-test survey was used to assess their baseline knowledge of the material and identify its perceived value prior to the BES. The post-test survey was used to assess if the seminar led to an improvement in their understanding of the material as well as if there was any change in its perceived value. All data was collected via Qualtrics and obtained within a 1-hour time period. Statistical analysis is descriptive. Paired T-test pending. Sample size consisted of 10 soccer and volleyball athletes.

Exploring the Impact of an Educational Seminar on Injury Prevention as well Its Perceived Value among Collegiate Female Athletes (continued from previous page)

Authors: N. Tchekryguin, L. Harrison

Results: Most participants either were neutral, agree, or strongly agree with the pre-test survey Likert Scale questions pertaining to attitudes regarding athletes' perspectives on whether attending a sport-specific injury prevention seminar would enhance their athletic careers and long-term health, aid in identifying early warning signs of potential injuries, boost their confidence in injury prevention and management, and if they even cared about the topic of injury prevention/management. The pre-test survey multiple choice questions had more variability which showed that most participants understood common injuries in their respective sport and injury management protocols such as RICE. Otherwise, participants had little knowledge regarding basic anatomy and physiology, common mechanisms of injury, and effectiveness of proprioceptive training to prevent injury. After the BES, post-test survey Likert scale questions shifted to the strongly agree category for each question. The post-test multiple choice questions demonstrated an improvement in average correct answers for every question.

Conclusions: Attitudes prior to the BES demonstrated that athletes already want to engage in these types of seminars as it has benefits to their careers and long-term health. The BES reinforced these beliefs and further improved their willingness to engage in these activities. The pre-test survey multiple choice questions demonstrated deficits within their baseline knowledge of basic anatomy and physiology, mechanisms of injury, and the effectiveness of proprioceptive training. The BES was efficient in improving their knowledge of these categories within a short period of time. Therefore, it is reasonable to implement sport specific BES as part of athletic programs regular curriculum to help improve injury rates. In the future, more BES seminars should be conducted across various sports and correlated with injury rates the following season to see if there is any reduction of common injuries.

Emergency Medical Services (EMS) Disparities among Stroke Patients in Rural Areas: A Systematic Review of Empirical Research

Authors: M. Neal, E. Blythe, M. Hossain

Background: Stroke is currently the fifth leading cause of death in the United States. Prompt response and time to care are essential for effective treatment and limiting disability. In comparison to urban areas, rural communities face clear disparities in stroke response and care as they experience both higher incidences of stroke and overall mortality. Though there have been many primary studies and simulations looking at rural communities and stroke disparities, there has not been a comprehensive review of these articles. We aimed to compile all existing evidence regarding disparities in emergency medical services (EMS) for stroke management within rural communities in the United States.

Objectives: To examine the disparities that persist within pre-hospital stroke care upon activation of EMS in rural communities in the United States.

Methods: A systematic review in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was conducted in July 2023. Available literature abstracts from 2000-2023 from six leading databases and additional sources were independently assessed by 2 reviewers, with a specific focus on articles discussing rural populations, EMS, and stroke. Data extraction of the included articles was completed by both reviewers, followed by a narrative synthesis.

Results: 14 studies were found eligible for inclusion. Selected articles were found to display varying areas of interest; however, all focused on EMS provider response within rural communities. Overall stroke mortality was found at 18.6% among EMS-transported rural patients, compared to 16.9% in urban patients. Rural communities often faced extended transport times in traveling to PSCs, but access was greatly extended when accounting for lower-quality stroke centers. Rural EMS providers' competencies were found to be equivalent to urban providers, however, rural services were often discussed as being resource-limited institutions, with inadequate protocols and continuing education training.

Conclusions: Stroke disparities amongst rural communities were found to be multifactorial, with geographic hindrance, insufficient funding, effective personnel and protocols, and patient-related factors all contributing.

A Systematic Review: The Effectiveness of Digital Health Educational Interventions for Breast Cancer Patients and Survivors

Authors: Z. Jimoh, B. Syed, M. Hossain

Background: There is published research that describes how health educational interventions can positively affect the health outcomes of breast cancer patients and survivors. However, there is a gap in the literature synthesizing the effectiveness of digital health educational interventions in comparison to non-digital health educational interventions given to breast cancer patients and survivors. In this systematic review, we will analyze previously published research to determine whether or not breast cancer patients and survivors who received digital or electronic health educational interventions have more positive outcomes compared to those who received health educational interventions solely in the non-electronic format. Examples of non-electronic health educational interventions include but are not limited to written education materials, in-person consultations or follow-ups, or telephone calls with health care providers.

Objectives: The objective of this systematic review is to determine whether or not breast cancer patients and survivors who receive digital health educational interventions have more positive health outcomes (ex: treatment adherence, lifestyle enhancements, mental health outcomes, quality of life, symptom distress, satisfaction, and other biopsychosocial outcomes) compared to patients who do not receive these interventions.

Methods: We adhered to the methodologies described in the Cochrane Handbook for Systematic Reviews of Interventions to conduct this systematic review along with the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines. We included previously published studies that involve patients who have been diagnosed with breast cancer. The patients may be those who had just been diagnosed with breast cancer, those who were in the process of being treated for breast cancer, or those who have completed treatment for breast cancer. Therefore, the scope of this review extends to all possible participants who are cancer patients or survivors, irrespective of their cancer status at the time of conducting respective interventional studies. The type of interventions being considered are those delivered in the digital or electronic format. The primary outcomes of interest for this systematic review are patient health-related outcomes, which include but are not limited to treatment adherence, lifestyle enhancements, mental health outcomes, quality of life, symptom distress, satisfaction, and other biopsychosocial outcomes.

Preliminary Results: We searched six major databases and additional sources. Currently we are extracting data from the included articles. Our preliminary findings suggest that breast cancer patients and survivors who receive digital health educational interventions may have more positive health outcomes compared to patients who do not receive digital health educational interventions. Most intervention studies included outcomes such as improved cancer literary, adherence to care, improved quality of care, better health communication, psychosocial wellness, and other outcomes associated with digital health education. However, fewer studies were identified from low-income countries and marginalized communities, suggesting possible disparities in evidence and intervention efforts.

Conclusions: Finding that digital health educational interventions may have more positive outcomes for breast cancer patients and survivors could inform future practices regarding patient education in the setting of oncological care. More innovative technologies should be explored for digital cancer care promotion in diverse populations, bridging digital divide in oncology and improving the continuum of cancer prevention, care, and survivorship.

The Effects of Digital Health Interventions on Health Outcomes in Breast Cancer Patients and Survivors: A Systematic Umbrella Review

Authors: A. Halawa, L. Yamthe, M. Hossain

Background: Breast cancer ranks as a global top cancer and the second deadliest for US women. Ongoing disparities, notably among Hispanic and African American women, emphasize the necessity for effective interventions. Digital health interventions hold promise for enhancing outcomes in breast cancer patients and survivors, backed by existing evidence and the proposed umbrella review that aims to comprehensively synthesize available systematic reviews and meta-analyses in this domain.

Objectives: To conduct an umbrella review of existing systematic reviews and meta-analyses on the effects of digital health interventions on health outcomes in breast cancer patients and survivors.

Methods: We explored the literature and searched through six major databases and additional sources using our inclusion criteria focused on articles that examined digital health interventions, specifically those with at least 70% of the studies focused on breast cancer.

Results: We identified 26 articles (16 systematic reviews, 4 meta-analyses, and 6 mixed reviews) reviewing studies primarily from the United States published from 2012 to 2023. The studies predominantly focused on breast cancer, but some included other cancers. These studies explored diverse digital interventions like mobile apps, telehealth, and eHealth, showing positive outcomes like an improvement in QoL, mental health, and self-efficacy. Notably, however, while digital health interventions helped with anxiety and depression during chemotherapy, further research is necessary for understanding their long-term impact on survivors.

Conclusions: Digital health interventions demonstrate promising outcomes in enhancing quality of life and psychological well-being for breast cancer patients and survivors. Though helpful in easing anxiety and depression during chemotherapy, more research is essential to gauge their long-term effects on survivors, emphasizing the need for ongoing investigations to tackle disparities and advance breast cancer care.

Additional Mitral Valve Repair for Patients Undergoing CABG with a History of Moderate Mitral Valve Regurgitation: A Case for Short Term and Long-Term Post-Operative Survival.

Authors: C. Anokwuru, M. Currie, R. Dale

Abstract

For patients with severe mitral regurgitation undergoing coronary artery bypass grafting (CABG), there are clear recommendations opposing concomitant procedures at the time of CABG. However, for patients, with moderate mitral valve regurgitation, the guidelines for additional surgical procedures are ambiguous. Through an extensive literature review, my project will answer if a CABG alone or a CABG and mitral valve repair is more beneficial to a patient's postoperative overall survival at 30 days and 5 years. I analyzed 300 relevant scientific publications and further narrowed them based on our inclusion and exclusion criteria. The preliminary results reveal a disagreement; some papers support patients undergoing a CABG alone, others show that the CABG and mitral valve repair is beneficial, and that CABG and mitral valve repair yields negative outcomes. Lastly, there is slightly more support for no significant difference on survival for patients undergoing simultaneous CABG and mitral valve repair in the long term.

Inflammatory Response of Neutrophils to Cytokines Present in the Tears of Keratoconus Patients

Authors: P. Desai, K. Perez, P. Bhattacharrya, M. Walker

Background: Keratoconus (KC) is an inflammatory disease of the cornea that results in thinning and rearrangement of the stroma and epithelium, and leads to corneal ectasia, distortion, and scarring. It can be visually devastating and often requires corneal transplantation. KC has historically been defined as non-inflammatory due to a lack of cardinal signs of inflammation (e.g., redness, edema, pain), but more recent studies have established that sub-clinical inflammation exists in the disease (e.g., inflammatory cell phenotypes, increased cytokines in tears). As more is discovered about KC and its potential links to inflammation, there is a growing interest in cellular and inflammatory responses involved. Specifically, research has shown that pro-inflammatory neutrophils are present on the ocular surface in higher numbers in individuals with KC, although it is unclear how they respond to the known inflammatory tear environment present in KC. We have begun to investigate the presence of neutrophils on the ocular surface and in the blood of patients with KC. The purpose of this project is to isolate blood neutrophils from normal and KC and culture them with known inflammatory mediators present on the ocular surface in KC (interleukin (IL)-6 and -8) to evaluate how a KC neutrophil responds compared to normal.

Objective: To determine the presence of neutrophils in normal and KC blood and assess their phenotypic response after treatment with IL-6 and IL-8.

Methods: Single-site, in vitro comparative study. At the UH Optometry Clinic, blood collection was conducted from 2 normal, healthy patients and 1 patient with KC. Blood samples were brought to the laboratory and were analyzed using automated hematology (DxH 500, Beckman Coulter) to determine the 5-cell leukocyte differential blood counts (lymphocytes, monocytes, neutrophils, eosinophils, basophils). From blood samples from 2 normals and 1 of the KC subjects, a negative selection, column free magnetic separation system (EasySep, Stem Cell Technologies) was used to isolate neutrophils from the whole blood. The sample was analyzed again after separation with the DxH 500 to confirm success of the isolation, and then 2,000 cells per well were aliquoted into an 8-cell chamber slide in duplicates and allowed to settle at 37°C for 30 minutes. Cells were then treated (in duplicates) with either IL-6 or IL-8 in 10, 20, and 50nM concentrations for 30-minutes (37°C, 5% CO2). One IL-6 well was placed onto an onstage incubation system for a fluorescent microscope (EVOS M5000) for time lapse imaging. After treatment, the supernatant from all the chamber slides was collected and stored at –80C until analysis. Chambers slides were washed with PBS, fixed with 4% PFA, and stained for DAPI and myeloperoxidase (MPO) then imaged using the EVOS M5000 Imaging System. Images were evaluated using ImageJ where neutrophil cell count, circularity, and solidity are determined. Supernatants were tested for inflammatory cytokine release using a multi-plexed immunoassay (Luminex 200, Luminex corp), run according to manufacturer instructions for tissue supernatants. All outcomes were compared between testing concentrations and between KC and normal.

Inflammatory Response of Neutrophils to Cytokines Present in the Tears of Keratoconus Patients (continued from previous page)

Authors: P. Desai, K. Perez, P. Bhattacharrya, M. Walker

Anticipated Results: The authors hypothesize that there will be a heightened inflammatory response present in the blood collected from the KC patients, indicated by elevated numbers of blood neutrophils that are more responsive to IL-6 and IL-8. We anticipate that treatment with IL-6 and IL-8, particularly IL-8 which is a strong chemotactic factor for neutrophils, will induce morphological changes indicative of activation (e.g., increase in cell circularity scores) and will trigger release of MPO and other inflammatory mediators from neutrophils. This study is expected to establish a protocol for isolating and testing cellular responses to inflammatory mediators in KC, and the pilot data collected here on normal and KC is expected to suggest that the inflammatory response of KC cells is stronger than normal.

Conclusions: This study establishes a novel protocol for testing the inflammatory response of blood neutrophils from KC and normal subjects. The preliminary results suggest that KC exhibits a more inflammatory blood leukocyte profile than normal and that neutrophils in the disease are more easily provoked by inflammatory cytokines.

CEAL Survey Examining Vietnamese Americans' Level of Trust in Sources of Information and Willingness to Participate in COVID-19 Clinical Trials

Authors: S. Vargas, S. Siddiqi, C. Nguyen, B. King, L. Gilbert, J. Diep, B.M. Nguyen

Background/Significance: People of Vietnamese descent are one of the largest Asian American populations, but are underrepresented within the demographics of COVID-19 clinical trials. With the rising awareness of misinformation, there is concern about the sources of information Vietnamese Americans use and association with COVID-19 clinical trial participation.

Objective/Purpose: To investigate levels of trust in sources of information and correlate with the willingness of Vietnamese Americans to participate in SARS-CoV-2 trials.

Methods: The NIH Community Engagement Alliance (CEAL) Common Survey 2 contained questions about the level of trust in sources of information and willingness to sign up for a clinical trial for a COVID-19 treatment. The instrument was translated into Vietnamese and available electronically. Vietnamese adults in Texas were recruited between September 2021-March 2022 via partnerships with community organizations, health fairs, and clinics. Survey results were analyzed using logistic regression.

Results: In total, 212 were analyzed with case availability. Willingness to participate in a clinical trial was associated with trust in universities/hospitals (OR=4.91; 1.35-17.89) and the drug companies (OR=; 4.14; 1.77-9.67). Trust in information from federal (OR=2.27; 1.16-4.47) and local/state governments (OR=2.30; 1.17-4.52) was associated with a willingness to participate in a trial. Trust in information from local clinics was associated with unwillingness to participate in a trial (OR=0.30; 0.12-0.73).

Conclusion: The results provide insight into Vietnamese Americans' trusted sources of information regarding COVID-19 clinical trials and willingness to participate. Removing barriers of distrust is critical for improving racial and ethnic diversity in COVID-19 therapeutic clinical trials.

Understanding the Correlation Between Pulmonary Valve Atresia and Childhood Cancer: Exploring Genetic Mutations, Ionizing Radiation, and Survival Analysis

Authors: K. Mims, J. Schraw

Background: Prior research has indicated potential correlations between congenital heart defects (CHD), particularly pulmonary valve atresia (PVA), and the increased risk of childhood cancer. However, the specific mechanisms and associations remain understudied. No comprehensive evaluations have delved into the potential linkages between different clinical presentations of PVA and childhood cancer, especially non-CNS solid tumors. Moreover, limited exploration exists regarding the impact of genetic mutations and ionizing radiation on this association, leaving a gap in understanding the interplay between these factors.

Objectives: This study aims to investigate the correlation between PVA and childhood cancer, focusing on potential genetic mutations and ionizing radiation exposure. The primary objective is to ascertain the survival rates over time among individuals with various forms of PVA compared to those without PVA. Secondary objectives include assessing associations between different clinical presentations of PVA and childhood cancer, particularly non-CNS solid tumors, as well as exploring the impact of genetic conditions like 22q11.2 deletion syndrome.

Methods: Utilizing data from GoBack, encompassing birth records and BPA codes identifying birth defects in affected children across multiple states, this study employs a retrospective cohort design. Cox regression analysis is employed to examine potential associations, while Kaplan-Meier analysis and Cox regression assess survival over time. Adjustment for confounding variables such as birth weight, maternal education status, and maternal plurality is conducted.

Results: Preliminary analysis reveals a strong association between myeloproliferative diseases and pulmonary atresia, particularly the PA-VSD subtype, known to result from alterations in the second heart field and neural crest pathways. The most prevalent genetic condition observed in this context is the 22q11.2 deletion syndrome.

Conclusions: The findings highlight a substantial correlation between specific forms of PVA, genetic mutations like 22q11.2 deletion syndrome, and myeloproliferative diseases. These results support the potential double-hit hypothesis, suggesting that individuals with PVA may possess certain genetic mutations and are additionally exposed to ionizing radiation during critical developmental periods. Further exploration is crucial to elucidate these associations, potentially guiding preventive strategies and clinical interventions.

Assessing the Impact of USMLE Step 1 Pass/Fail Transition on Medical Students' Stress Levels: A Pilot Survey Study

Authors: S. Zimmerle, B. Rosamond, N. Lyons, J. Lall, S. Maldonado, Z. Ali, M. Liang

Background: In 2022, the USMLE Step 1 exam converted to a pass/fail scoring system. Many studies have reported resident, attending, and program director opinions on this change. However, no such literature has been published detailing the opinions of a large group of current medical students.

Objectives: To pilot a large survey that aims to determine the impact of the change in USMLE Step 1 scoring on the mental health and well-being of medical students.

Methods: A web-based survey was posted to a medical student specific Student Doctor Network forum in July 2023. Data collected included medical student demographics, and perceived impact of change on academic performance, career goals, and stress levels. Categorical data was measured using a self-reported Likert scale. Data was analyzed using descriptive statistics and inferential analysis to identify significant patterns and trends.

Results: 28 student responses were recorded. The respondent pool were mostly white/Asian males enrolled in a US MD program. Results were equally spread between medical school class distinctions. Most respondents completed Step 1 before the survey was released (N=17,63%). Respondents reported “slightly disagree” in response to the Step 1 score change. Applicants reported “normal” stress (5/10) pertaining to Step 1 changing and “slightly more stress than normal” (6.8/10) pertaining to taking Step 2 in the future. Respondents reported “disagree” when asked if the change to pass/fail scoring will make the residency process more holistic.

Conclusions: Transitioning Step 1 to pass/fail scoring may increase medical student perceived stress and have adverse effects on student well-being moving forward. As medical education evolves, it is crucial to keep medical students and their opinions at the center of future policy developments.

Impact of Randomized Controlled Trials on Practice Patterns

Authors: Y. Seo, B. Rosamond, M. Liang

Background: Randomized controlled trials are considered the gold-standard for guiding clinicians in medical practice. However, randomized controlled trials face many barriers including high cost, time to completion, and time to adoption. It is a field such as surgery where technology and innovation are rapidly changing, it is unclear on the impact of randomized controlled trials has on the specialty. We evaluated one sub-specialty within general surgery (care of patients with ventral hernias) and the relationship randomized controlled trials had with practice patterns.

Objectives: To determine the impact that randomized controlled trials have on the care of patients with ventral hernias.

(Tentative) Methods: Utilizing PRISMA guidelines we performed a systematic review of all randomized controlled trials pertaining to the management of patients with ventral hernias in the past 20 years. Simultaneously, we identified all studies of ventral hernias from nationwide databases. Utilizing the conclusions of the randomized controlled trials, we evaluated the prevalence of practice patterns of conclusions/recommendations drawn from these randomized controlled trials before and after the publication of these randomized controlled trials.

(Tentative) Results: The authors predict that randomized controlled trials and practice patterns had three main relationships (1) Adoption of recommended prior to the randomized controlled trial resulting in the performance of the randomized controlled trials; (2) Randomized controlled trial rapidly changing patient care practices; (3) Randomized controlled trials with slow or no adoption of practice patterns.

(Tentative) Conclusions: Randomized controlled trials have wide and varied impact on practice patterns in general surgery. Often practice patterns are adopted prior to performance of randomized controlled trials and performance of trials either confirms or changes practice patterns. There is a great need in surgery to perform more randomized controlled trials prior to adoption of practices supported by data at high risk for bias.

The Extraordinary Babies Study: Comparison of 3 Developmental Screening Measures for Identifying Developmental Delays in Young Children with Prenatal Diagnosis of Sex Chromosome Trisomies

Authors: A. Radunovic, S. Bothwell, T. Thompson, S. Davis, J. Ross, N. Tartaglia

Purpose: As non-invasive prenatal testing expands, increasing numbers of infants are being identified in the prenatal period with Sex Chromosome Trisomies (SCT), including XXX, XXV /Klinefelter syndrome, or XYY. Children with a SCT are at increased risk for developmental delays in both early language and motor domains. Developmental screening measures with optimal diagnostic accuracy, as measured by sensitivity and specificity, are necessary for the proper care and referral of children with SCT. The eXtraOrdinarY Babies study previously identified low sensitivity and specificity of the Ages and Stages Questionnaire (ASQ) at 6 and 12 months of age. In this project we aimed to: (1) build upon previous analyses with larger sample sizes and expanded age range up to 24 months, and (2) evaluate 2 additional screening measures including the Parents' Evaluation of Development Status (PEDS) and the Infant Toddler Checklist (ITC) to determine their usefulness to detect developmental delays for this high-risk population.

Methods: The eXtraOrdinarY Babies Study is a natural history study of infants with a prenatal diagnosis of XXX, XXV, or XYY. Caretakers completed the ASQ, ITC, and PEDS prior to direct developmental evaluation using the Bayley Scales of Infant and Toddler Development (Bayley-3 or 4) at the 6 month (n=114), 12 month (n=132), and 24 month (n=79) visits. Developmental delay was defined as a Bayley scaled score of less than 7. Domains of each screening tool were matched with corresponding Bayley domains, and sensitivity/specificity analyses were conducted for the 3 screening measures at each timepoint. Desired sensitivity and specificity were 0.8 or above.

Summary of results: There were no differences in developmental scores between the 3 SCT subtypes, thus all were combined for analysis. Overall, the ASQ, PEDS, and ITC sensitivities were below threshold for acceptability across almost all developmental domains at all timepoints, with sensitivity values ranging from 0.09 to 0.67. The exception was the ASQ at 12 and 24 months in the gross motor domain with sensitivities of 0.94 (12m) and 0.75 (24m). Specificity results were higher across all three measures ranging from 0.5 to 0.97.

Conclusions: All three developmental screening tools evaluated had low sensitivities in young children with SCT due to high false negative rates, and thus cannot be relied upon for identifying all cases with developmental delays. However, the higher specificity values indicate fewer false positives overall. Based on these results, direct developmental assessments are recommended for infants with SCT due to the heighted risk for delays and the lack of appropriate screening measures to ensure necessary referrals to early intervention therapy. Future directions include analyses of items most predictive of delays to determine if alternative scoring or new screening measure specific to the profile in children with SCT may be developed.

Effects of COVID-19 Infection on Fetal Growth in Pregnancy

Authors: O. Balogun, N. Plenty, K. Zhang-Rutledge, S. Willis, K. Emanuel, F. Karimghovanloo, A. McCall, A. Samuel

Background: Pregnancy is associated with an increased risk of acquiring respiratory infection with higher morbidity and mortality than nonpregnant subjects, with infections known to affect fetal growth and development. Studies have shown a higher frequency of maternal vascular malperfusion in the placental bed in pregnant women infected with COVID-19. This malperfusion can lead to inadequate blood flood to the placenta and impair substance exchange. Currently, there is limited data that evaluates the impact of COVID-19 infection during pregnancy on fetal growth and development. As a result, there is little consensus on perinatal recommendations and counseling that should be given to women infected with COVID-19 during pregnancy. Amidst the pandemic, the Maternal Fetal Medicine Clinics continued to perform serial growth ultrasounds and additional antenatal testing in the third trimester in women infected with the disease. Whether cases of fetal growth restrictions (FGR) or impacted fetal outcomes were increased in this population is unknown. The aim of this study was to provide clinical information for clinicians and patients regarding the impact of COVID-19 on fetal growth and development. We hypothesize that COVID-19 will increase the risk of fetal growth restrictions compared to pregnant women without COVID-19.

Objectives: The purpose of this study was to perform a retrospective review of all ultrasounds performed in women identified to have COVID-19 during June 2020-December 2022 and evaluate the impact on fetal growth.

Methods: All patients aged 16-55 years old with a singleton pregnancy who received an ultrasound at Obstetrix Maternal-Fetal Medicine Specialist of Houston between June 2020 and December 2022 were included in this study. COVID-19 infection during pregnancy was defined as a self-reported positive SARS-Co-2 RT-PCR or Rapid Test. FGR was defined as estimated fetal weight and/or abdominal circumference less than 10% for gestational age. Maternal and fetal characteristics, including FGR, were collected and compared between the two groups. Women found to have major congenital anomalies or multiples were excluded from this study.

Results: Among the 21,917 women with a singleton pregnancy who received an ultrasound at Obstetrix Maternal-Fetal Medicine Specialist of Houston between June 2020-December 2022, 484 (2%) had COVID-19 infection during pregnancy and 21,433 (98%) did not. Of those who had COVID-19 infection during pregnancy, there were 45 (9%) cases of FGR, and when compared to pregnant individuals reporting negative for COVID-19there were 2,928 (14%) cases of FGR, p=.005. When the 484 women who had COVID-19 were stratified by the timing of their COVID-19 infection by the first, second, and third trimester, there was no significant difference in the proportion who had an offspring with FGR (p=0.33 Cochran-Armitage test for trend).

Conclusions: COVID-19 infection in pregnancy, when compared to those who do not have COVID-19 infection in pregnancy does not appear to be more associated with FGR. Our study suggests that the performance of routine serial fetal growth ultrasounds may not be indicated in pregnant women solely for the purpose of having a history of COVID-19 infection during pregnancy.

Polygenic Risk Scores of Different Metabolic Traits in a Peruvian Population

Authors: A. Castaneda, O. Alquicira, A. Heath, J. Miranda, W. Checkley, A. Barnabe-Ortiz, P. de Vries

Introduction: Polygenic scores (PRS) are a valuable tool for predicting the risk of disease by using information from multiple genetic variants. However, there are concerns that the lack of diversity in the reference datasets used to develop and validate PRS limits the generalizability and accuracy of risk prediction in underrepresented populations. This study aims to evaluate the generalizability of existing PRS for cardiometabolic phenotypes in a South American population of largely Native American ancestry. This will provide valuable insights into the applicability of PRS in non-European populations and improve risk prediction, allowing for more personalized and targeted interventions.

Methods: The CRONICAS cohort study is a population-based cohort study including 3000 Peruvian participants from urban and rural settings at three study sites. Genome-wide genotypes were generated for 813 participants from the Puno site. PRS for 10 cardiometabolic phenotypes were created, including systolic blood pressure, body mass index, low density lipoprotein, high density lipoprotein, triglycerides, fasting glucose, fasting insulin, and cholesterol. All PRS were pre-adjusted for ancestry-informative principal components. Linear regressions were then performed to identify the association between the PRS and quantitative cardiometabolic phenotypes, while logistic regression was used for dichotomous phenotypes.

Results: A total of 813 participants were genotyped with about equal proportions of men and women (48.0% vs 50.8%) and rural and urban inhabitants (50.9% vs 48.1%). Our dataset was predominantly made up of people aged 30–60-year-old (65.2%) compared to those 61 and older (34%) and an average age of 55.8. Blood lipid levels of participants trended normal or borderline high with an average LDL-C of 123 mg/dL, TG of 147 mg/dL, HDL-C 43, and total cholesterol of 196 mg/dL. There were statistically significant associations between lipids levels and our polygenic risk scores, including LDL-C, HDL-C, and TG (all $p < 0.001$). Other phenotypic traits that were statistically significant include waist circumference and type 2 diabetes (both $p < 0.05$).

Conclusions: Polygenic risk scores are well powered to predict elevated lipid levels in a population of South American individuals. This may be attributed to the significant Hispanic ancestry included in the underlying genome wide association studies. One other factor contributing to the strong predictive performance found in lipid metabolism is its strong heritability1,2. Lipid levels are commonly used in practice to guide treatment and assess risk for cardiovascular disease due to its strong association with heart disease3. Accurate prediction using PRS can improve our ability to identify individuals with strong genetic predispositions of dyslipidemia. This would allow us to initiate early interventions to prevent heart disease such as lifestyle modifications, initiating medication, and proactive monitoring, to prevent the development or progression of heart disease.

Developing and Evaluating a Competency-Based Training to Meet the Needs of People with Neurodevelopmental Disorders during Physical Examinations

Authors: S. Taylor, W. Gandy, R. Lehardy

Aims and Objectives: This study aims to address health disparities experienced by individuals with neurodevelopmental disorders (NDD) by implementing a training program designed to enhance physicians' ability to conduct cooperative physical examinations for NDD patients.

Background:

Methods: We recruited a cohort of five first-year medical students to participate in the training program. We assessed their confidence levels before and after the training and evaluated their competence in utilizing the intervention. Furthermore, we measured the sustainability of these skills over time.

Results: The participants successfully completed the training program within approximately 2 hours. To be considered "competent," they needed to achieve a passing score of 90% or higher. Three participants demonstrated competence following the didactic portion of the training, while the remaining two achieved competence after completing the didactic portion and receiving feedback. All participants consistently demonstrated competence during maintenance checks. Additionally, perceived confidence increased significantly after the didactic training.

Conclusion: This study demonstrates that participants not only acquired competence in conducting examinations for individuals with NDD but also saw an improvement in their perceived confidence. Importantly, these skills were found to be sustainable over time, eliminating the need for continuous maintenance.

Relevance: The findings from this study suggest that providing training on how to conduct physical examinations for individuals with NDD can enhance the competency and confidence of medical students. This study offers a model for medical schools to consider integrating into their curriculum, with the potential to reduce health disparities experienced by individuals with NDD.

Clinical Outcomes in Early-stage Non-small Cell Lung Cancer Patients with Driver Mutations Who Underwent Reflex Molecular Testing

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Introduction: One-third of patients with newly diagnosed non-small cell lung cancer (NSCLC) present at an early stage. Surgical resection remains the standard of care for medically fit patients. Adjuvant chemotherapy has shown benefit in stage II and III disease, but with the advent of immune checkpoint inhibition and targeted therapy, the adjuvant setting is now evolving. In 2017, all hospitals in the Houston Methodist Hospital (HMH) system approved reflex molecular testing at the time of diagnosis for all new cases of NSCLC, regardless of the clinical or pathologic stage. We performed a retrospective analysis of patients with NSCLC who underwent reflex molecular within the HMH system. Here we report outcomes for patients with early-stage EGFR-mutated NSCLC.

Materials/Methods: Data was collected from a network of 7 hospitals for patients who underwent reflex molecular testing from January 1, 2017, to August 31, 2022. Patients diagnosed with stage I-II NSCLC and molecularly confirmed EGFR mutations were included. Baseline characteristics included age at diagnosis, sex, race, smoking status, performance status, and comorbidities. Pathologic assessment included histologic subtype, molecular results, and time from diagnosis to results of reflex molecular testing. Treatment information included initial surgery, radiation, and adjuvant therapy if given. Recurrence free survival (RFS) and overall survival (OS) were reported using Kaplan Meier methodology.

Results: There were 37 patients included, with a median age at diagnosis of 71.2 (48-85) years. Of these, 26 (70.3%) were females, 21 (56.8%) were non-Hispanic Caucasian, and 16 (43.2%) were current/former smokers. All cases were histologically confirmed adenocarcinoma and 29 (78.4%) were stage I disease. Thirteen (35.1%) patients had exon 19 deletion, 17 (45.9%) had exon 21 L858R, and 3 (8.1%) had two synchronous EGFR mutations. Median time from diagnosis to EGFR results was 18 (5-134) days. Reflex test resulting time from 2017-2018 and 2019-2021 was 22 (5-134) and 16 (8-96) days, respectively. Per standard of care, thirty-four (91.9%) patients underwent surgical resection and 3 (8.1%) received radiation. Five (13.5%) patients received adjuvant chemotherapy and 5 (13.5%) received EGFR-targeted therapy. At last follow-up, 7 (18.9%) patients had recurred and 4 (10.8%) died. RFS at 3 and 5 years was 68.2% and 56.9%, respectively. OS at 3 and 5 years was 88.7% and 82.8%, respectively.

Conclusion: Reflex molecular testing at our institution has allowed for insight into outcomes of patients with early-stage NSCLC harboring EGFR mutations. With the adjuvant landscape evolving, broader adoption of reflex molecular testing in early-stage lung cancer should be implemented. Our analysis shows a time improvement in molecular testing result acquisition, along with similar DFS and OS reported in other studies. Analysis of data for mutations in the BRAF, KRAS, and ERBB2 genes is currently underway.

A Retrospective Analysis of the Prognostic Outcome of the Unresponsive-BCG Non-muscle Invasive Bladder Cancer

Authors: A. Vu, L. Smith, S. Kim, S. Lerner

Background: Bladder cancer (BC) is divided into two subtypes based on the infiltration extent of tumor cells into the bladder muscle, on which two-thirds of BC is non-muscle invasive (NMIBC). The standardized therapy is a serially intravesical instillation of BCG therapy to decrease the tumor recurrence and prevent progression to MIBC. Once the BCG therapy fails to progress to MIBC, the unresponsive-BCG NMIBC (unBCG) should be considered radical cystectomy (RC) which is the surgical removal of the whole bladder with a pelvic lymph node.

Objectives: This retrospective study was aimed to evaluate prognostic outcomes of the unBCG including recurrence-free survival (RFS) within one year and overall survival (OS). The inclusion criteria of patients are based on the FDA-defined criteria of unBCG after adequate intravesical BCG therapy including 5~6 cycles of induction and 2 at least two cycles of maintenance therapy.

Methods: Between 2015 and 2022, a total number of 122 patients were retrospectively enrolled and all the clinicopathological variables including therapeutic information were evaluated based on the retrospective review of medical charts. After the FDA definition of the unBCG, a total number of 28 patients were excluded (see figure 1). Among the final enrolled number of 94, two groups were divided based on the BCG responsiveness, unBCG (N=26), and responsive BCG (reBCG, N=68) groups. The prognostic outcomes are 3,6,9, 12 months of recurrence-free survival rates (RFS) including upper urinary tract recurrence rate (UTUC) and the overall response rate (OS). The statistical analyses were analyzed with a significant p-value of less than 0.05.

Results: A total of 94 patients' mean age is being calculated and male-to-female gender ratio is 75/19. During a median follow-up of 12 months, there are 26 recurrences including 1 upper urinary tract lesion (UTUC) recurrences and 1 cancer-specific death. About 89.4% of patients received at least 2 cycle of maintenance therapy. The overall median 3,6,9, 12 months RFS and OS are currently being calculated by our statistician. Between unBCG (N=26) and reBCG (N=68) groups, the baseline characteristics showed that the BMI variables show a significant difference based on the initial raw data ($p<0.05$). The median maintenance cycle of BCG was also significantly different between two groups. We are continuing to work with the statistician to get the exact significant values. In a comparison of survival outcomes, the unBCG group had significantly poorer RFS and OS than the reBCG group (we are working with the statistician to determine the p-value).

Conclusion: The unBCG had significantly poorer survival outcomes in terms of recurrence at one year. Based on our initial raw data, we found some significant differences between the two groups which impacted poor prognostic survival in the unBCG group. Continuing forward, we will attempt to compare the outcomes of different treatments after unBCG.

The Impact of Copper II on Aggregation Studies: And The Possible Implications On Amylin

Authors: S. Campbell, A. Chitsosa, T. Clemons

Background: African American communities have an increased exposure to copper at levels that are toxic. In the past few years there have been conflicting studies on the effects of copper in the body, some saying that it influences protein aggregation and others that deny that claim. Amylin is a 37 amino acid protein that is co-secreted with insulin and responsible for satiety, however, when in an aggregated form it can cause pancreatic beta cell death and contribute to the onset of Type II diabetes. Understanding the effects of copper on protein aggregation can further our understanding of copper toxicity and its effects on African American communities and the incidence of Type II diabetes. Even though Thioflavin T (ThT) is a standard agent used to measure protein aggregation, in the presence of copper, it may lose its accuracy. Verification of the accuracy of ThT as a model for studying protein aggregation under toxic conditions is needed in order to determine if another method of detection, such as the use of microfluidic devices, might be better suited for such studies.

Objectives: This is the first phase of the study, and the objective of this phase is to determine if the exposure of ThT to copper changes the intensity of the light emitted by ThT. If true, this information will suggest that ThT may not be the best method for examining protein aggregation in the presence of copper.

Methods: The experimental approach included incubating Thioflavin T with different concentrations of Copper II and examining the change in yellow intensity of Thioflavin T.

Results: The results indicate that Copper II impacts the absorbance (and thus aggregation) under certain conditions

Conclusions: Next, we will repeat the experiments using amylin in place of a-synuclein and compare the results. Although Thioflavin T is the standard that is used for aggregation, if Thioflavin T is causing inaccurate results for the impact on Copper II on protein aggregation then the use of Thioflavin T should be abandoned for Copper II toxicity studies and instead more sophisticated studies, such as the use of microfluidic devices, should be considered as the standard method.

Review of Hyaluronan Effects on Human Corneal Wound Healing

Authors: G. Saldana, D. Martinez, S. Verma, V. Coulson-Thomas

Background: Human corneal injuries occur in several forms such as pathological or trauma and may cause a wide range of debilitations such as physical, mental, and financial. Available treatments frequently include topical hyaluronic acid administration which has been extensively supported by studies to induce corneal wound healing in a variety of corneal injuries. While the utilization of hyaluronic acid is safe and effective, there is a lack of available data that stratifies the methods of administration in past studies. In this literature review, we seek to stratify different variables within human randomized control trials that study the use of hyaluronic acid for corneal wound healing. This transparency of information will allow us to improve data analyzation when it comes to administration of hyaluronic acid as well as which populations will benefit most from treatment.

Objectives: Evaluate the efficacy of Hyaluronan on corneal wound healing.

Methods: This literature review was conducted in adherence to PRISMA 2020 guidelines, preregistered on PROSPERO, and it investigated the effectiveness of topical hyaluronan on wound healing. Using an unfiltered search approach on PUBMED and University of Houton Libraries, 246 records were obtained. The initial screening was conducted by two researchers who classified each study by type of injury, species, and mode of hyaluronan administration. A total of 16 articles with human subjects were selected. The data extraction was conducted by following the PRISMA checklist and by thorough confirmation of various authors that covered demographics, hyaluronan specifics, administration information, treatment strategies, and outcomes.

Results: Among the 16 studies, only 3 studies specified the molecular weight of hyaluronic acid used. This is significant because there has not been a clinical study that indicates the most effect properties for HA administration. Furthermore, 8 different concentrations were used to promote hyaluronic acid between the 16 studies. This could be an indicator that the optimal concentration and molecular weight for hyaluronic acid administration has yet to be discerned for clinicians.

Conclusion: Knowing treatments for corneal injuries is crucial because the cornea is crucial for eyesight and protection. In this review, Hyaluronic Acid was evaluated for corneal wound healing. The limitations of this study included variations in patient demographics, HA composition and population heterogeneity, and omission of animal models. The diversity in HA concentrations highlights the need to consider molecular weight in future studies. When there are no standardized protocols and consensus on administration, quantity, and frequency, it can be difficult to guide clinicians. Future investigations should give priority to molecular weight considerations to optimize HA therapy, highlighting the need for ongoing investigations and consensus building within this field.

Protective Effects of Hyaluronan against Corneal Hypoxia

Authors: N. McGaskey, A. Hurd, C. da Silva, I. Moreno, S. Verma, V. Coulson-Thomas

Background: Throughout the day the cornea is exposed to decreased levels of atmospheric oxygen concentrations (hypoxia), such as, during the closed-eye phase of sleep, with contact lens wear and following corneal injuries as part of the wound healing process. Hypoxia affects the cornea in multiple aspects, including disturbance of the epithelium barrier function, and inducing corneal edema, corneal stroma thinning, and alterations in the composition of the extracellular matrix (ECM), which all culminate in alterations of cornea function. Hyaluronan (HA) is a major ECM component in the cornea that is up-regulated after injury and has been shown to serve a protective role in tissues against inflammation and oxidative stress; however, it is unknown whether HA has a protective role in tissues against hypoxia.

Objectives: Investigate whether HA has a protective role against hypoxia.

Methods: The potential of HA having protective effects against corneal hypoxia was investigated by subjecting human corneal epithelial cells (HTCEs) to hypoxic conditions in the presence or not of HA of different molecular weights, compared to cells under normoxic conditions. Additionally, we included a group where cells were maintained under hypoxic conditions, and 10 minutes prior to harvesting the cells, they were exposed to normoxic conditions, which would cause a momentary increase in reactive oxygen species (ROS), similar to what occurs as we open our eyes in the morning. Cells were analyzed by immunocytochemistry and real time PCR (qPCR).

Results: Hypoxia leads to an increase in Hypoxia-inducible factor (HIF-1) expression and cytoskeleton rearrangement in HTCEs. Supplementation of mid-molecular weight HA (mid-MWHA) and high MWHA (HMWHA) into the media of HTCEs prevents the hypoxia induced increase in HIF expression, while all forms of HA were able to prevent cytoskeleton rearrangement under hypoxic conditions. Placing HTCEs for 10 minutes under normoxic conditions was enough to revert HIF-1 levels to baseline levels.

Conclusions: HA is able to prevent hypoxia induced changes in HTCEs, with mid-MWHA and HMWHA having most significant effect.

Recommendations Next Steps: Our subsequent investigation involves conducting quantitative polymerase chain reaction (qPCR) across all experimental data points. This phase will entail the identification and comprehensive analysis of key indicators, including hypoxia markers, reactive oxygen species, inflammatory markers, and alpha-smooth muscle actin. The objective is to substantiate the findings derived from immunocytochemistry, enhancing the depth of our results.

Health-Harming Legal Needs are Associated with Blood Pressure, Quality of Life, and Utilization

Authors: S. Sanchez, D. Medford, B. King, W. Liaw, L. Tran, M. Arocha, O. Adepoju, L. Woodard, J. Dobbins, B. Moscoso, I. Sharma

Context: Medical-legal partnerships (MLPs) target health-harming legal needs (HHLNs) by embedding legal services within clinics. The impact of HHLNs on chronic disease, quality of life, and utilization is uncertain.

Objective: Determine whether the number of HHLNs is associated with high blood pressure, worse quality of life, and higher utilization.

Study Design: Cross-sectional.

Setting: An MLP involving a federally qualified health center and legal services organization Population: Individuals, 18 years old and above, who received care at the clinic. Intervention/Instrument: Patients were offered screening (23-items) between March 2021 and June 2022. We summed HHLNs, by adding the positive responses for each subdomain.

Outcome Measures: Blood pressure status was measured by two approaches. First, we used the presence of hypertension diagnostic codes or anti-hypertensive medication to categorize individuals as having high blood pressure. Second, we used the most recent mean arterial pressure (MAP). Quality of life was assessed using a health-related quality of life instrument regarding the number of unhealthy physical or mental days in a month. Participants reported the number of urgent care, emergency department (ED), and hospital visits over the prior 12 months. Using an available case analysis approach and logistic regression, we assessed the association between the number of HHLNs and the presence of hypertension diagnoses or medications. For MAP, unhealthy days, and utilization, we used linear and negative binomial regression models.

Results: Four hundred seventy-five participants completed surveys. Less than half (198; 41.7%) reported at least one HHLN. The number of HHLNs was associated with having a diagnosis of or medication for hypertension (OR=1.08, p=0.049) but was not associated with MAP (coeff=0.098, p=0.596). The number of HHLNs was similarly associated with more unhealthy physical (coeff=0.150, p=0.015) and mental days (coeff=0.157, p=0.002). More HHLNs were also associated with higher urgent care (coeff=0.252, p<0.001) and ED utilization (coeff=0.181, p=0.014) but not hospitalizations (coeff=0.099, p=0.150).

Conclusions: The number of HHLNs was associated with hypertension, higher unhealthy physical and mental days, and higher urgent care and emergency department utilization. In future studies, assess whether these relationships persist when controlling for demographic variables.

Preparation of Regenerated Silk Fibroin Biomaterials

Authors: C. Rogel, W. Tariq, C. Liu, Z. Li

Background: Silk fibroin has been used as a biosynthetic material in clinical settings as wound dressing and surgical glue, due to its biocompatibility and biodegradable properties. Fibroin has also been shown to carry anti-coagulant and anti-inflammatory benefits. Our research focused on taking advantage of silk fibroin's anti-coagulation/anti-inflammatory to build a vein model based purely on silk fibroin that could potentially be used for treatment of venous diseases such as deep vein thrombosis. Our aim is further enhancing the degumming process used to extract silk fibroin from silkworms to yield a product with a higher concentration and more extensive cross-linkages to overcome fibroins weak tensile property and make it a better scaffold for clinical use. Preparation of silk fibroin was made using wild silkworm (Bombyx mori). Using the degumming method, the silk fibroin was extracted from the silk sericin layer using Na2+Co3, Polyethylene Glycol 3350, and dialysis, instead of traditional method which uses citric acid and autoclave. This method allowed us to attain a higher yield of silk fibroin along with retaining its physical, chemical, and mechanical properties, which would have been lost via traditional degumming.

Objectives:

- Learn the process of preparation of biomaterials with controllable degradable properties.
- Obtain a solution of silk fibroin hydrogel that can be used in future research to make skeletons for pumping machines to be used as an in vitro disease model.

Research Question: What impact would using an implantable fibroin silk-based vein model have vs using traditional DVT prophylaxis for deep vein thrombosis in vitro label models of artificial muscle vein pump.

Methods: Silk fibroin extraction was started with 5g of silk placed in a 0.02 M sodium carbonate solution to remove sericin layer. After rinsing and drying the silk was dissolved in 9.3 M LiBr at 60 degrees Celsius and later placed for dialysis in a cassette. Following dialysis, the silk solution was centrifuged to remove impurities and measure weight per volume percentage, or concentration of the silk fibroin in solution.

Results: These results yielded a silk fibroin solution with a weight per volume percentage of 7.46 w/v %.

Conclusions:

- The silk fibroin extraction was successfully completed.
- The silk fibroin solution obtained will be poured into a 3D printed resin vein mold that was designed by our lab team.
- Further research can be continued to obtain a more concentrated solution that will yield a stronger material.

Providers' Non-Cigarette Tobacco Use Intervention Practices in Relation to Beliefs about Patients, Prioritization of and Skills for Intervention, and Referral Knowledge in Texas Health Care Centers Providing Care to Persons with Behavioral Health Needs

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Background: Rates of non-cigarette (colloquially, other) tobacco use is elevated among adults with behavioral health conditions. Little is known about whether behavioral health providers are using brief interventions, including the evidence-based 5As (Ask, Advise, Assess, Assist, and Arrange) for other tobacco use, or what provider factors may be associated with use of these interventions.

Objectives: The current study redressed this gap. Overall, 86 providers in Texas (9 Federally Qualified Health Centers, 16 Local Mental Health Authorities (LMHAs) that provide a broad range of mental and behavioral health services, 6 substance use treatment programs in LMHAs, and 55 stand-alone substance use treatment programs) took a survey assessing their beliefs regarding (1) patients' concerns about other tobacco use; (2) their desire to quit; (3) importance of intervening on other tobacco use with cessation counseling; (4) perceived skills to intervene; (5) knowledge of referral options for treatment.

Methods: Logistic regression analyses were conducted to determine the association between each factor and use of the 5As.

Results: Results showed that 70.9% of providers asked patients about other tobacco use status, 65.1% advised them to quit, 59.3% assessed quit interest, 54.7% assisted with a quit attempt, and 31.4% arranged a follow-up. Providers who believed patients were concerned about other tobacco use, recognized the importance of offering other tobacco use cessation counseling, believed they had the necessary skills to treat other tobacco use, and possessed knowledge of referral options, respectively, were more likely to deliver the 5As (ps < 0.05).

Conclusion: Results add to a limited literature on provider intervention practices for other tobacco use in settings where behavioral health care is provided, highlighting the significance of provider beliefs, perceived skills, and referral knowledge to care delivery. Findings reveal opportunities to increase delivery of the 5As for other tobacco use to behavioral health patients and suggest provider factors that could be targeted to build this capacity.

Uncovering Connections Between Patient-Provider Communication and Health Information Sources in Black Adult Populations

Authors: Isabella Martingiano, Jessica Medrano, Ogheneyole Odharo, Seokhun Kim, Lorna H. McNeil, and Dalnim Cho

Background: Historically, Black individuals have encountered barriers to receiving equitable healthcare. Effective provider communication has been identified as a crucial factor influencing how patients perceive the quality of care they receive, potentially reducing healthcare disparities among Black individuals. When individuals are not satisfied with their interactions with healthcare providers, they may seek health information from unverified, alternative sources. However, there is currently a significant gap in our understanding of how patient-provider interactions influence health information-seeking behaviors within the Black community.

Objectives: The aim of this study was to investigate the associations between patient-provider communication and the preferred sources of health information among Black adults.

Methods: We conducted a cross-sectional analysis of Project CHURCH (Creating a Higher Understanding of Cancer Research and Community Health), a large cohort study initiated by The University of Texas MD Anderson Cancer Center in collaboration with several Black churches in the Houston metropolitan area. Project CHURCH was developed to understand disparities in cancer prevention risk factors within the Black community, guided by the principles of community-based participatory research. Descriptive and logistic analyses were undertaken, involving a total of 2,254 Black adults from three different churches.

Results: The majority (55.2%) of study participants preferred receiving health information from doctors or healthcare providers, followed by the internet (20.3%), written materials (e.g., books, brochures/pamphlets/magazines; 13.4%), cancer organizations (8.3%), and others (e.g., church members/friends; 2.7%). The results revealed a significant association between patient-provider communication and the preferred source of health information ($b=.06$, $SE=.02$, $p<.001$). Specifically, higher satisfaction among Black adults with patient-provider communication increased their preference for receiving health information from doctors or healthcare providers (than other sources). This association remained significant even after controlling for factors such as computer and internet access at home, healthcare insurance status, existing medical issues (e.g., diabetes, cancer, heart disease), and the level of reliance on God for health.

Conclusions: Black individuals' satisfaction with healthcare providers may have a significant impact on where they seek healthcare information. Results of the study underscores the importance of improving communication between Black patients and healthcare providers to enhance the quality of care and reduce health disparities in the community. Future research should focus on targeted interventions towards improving Black patients’ relationships and communications with healthcare providers.

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