dietary guidelines regarding their nutritional needs. OBJECTIVES/ GOALS: The objective of this study is to test the hypothesis that a healthy dietary pattern in the oldest old (aged 80 years and older) is related to greater compliance with dietary recommendations and better nutrient intake profiles. METHODS/STUDY POPULATION: We conducted a cross-sectional study of 122 participants aged 82 to 97 years old from the Geisinger Rural Aging Study (GRAS) cohort in rural Pennsylvania (n = 56 men and 66 women). The main outcome measures of the investigation were the daily nutrient intakes and food group intakes evaluated from the average of three 24-hour dietary recalls. The dietary patterns were determined by cluster analysis from 28 food groups. Diet quality and adherence to the Dietary Guidelines for Americans was assessed by the Healthy Eating Index (HEI)-2015 and the Dietary Screening Tool (DST). Recommended intakes were determined by the Recommended Dietary Allowances (RDAs) or Adequate Intakes (AIs). RESULTS/ANTICIPATED RESULTS: Less than 50% of participants met the dietary recommended intakes for vitamins D, E, K, B6, dietary fiber, zinc, potassium, and calcium. The more-nutrient-dense cluster was characterized by higher intakes of fruits and vegetables. The less-nutrient-dense cluster was characterized by higher intakes of foods including desserts and sweets. After adjusting for age, sex, and energy intake, participants in the more-nutrient-dense dietary pattern had a higher intake of vitamins A, D, K, C, fiber, and potassium (p < 0.05 for all). After adjusting for age and sex, participants in the more-nutrient-dense pattern had better diet quality assessed by the (HEI)-2015 (p < 0.001) and DST (p = 0.006). DISCUSSION/SIGNIFICANCE OF FINDINGS: Among the oldest old, many participants were found to have nutrient intakes lower than the recommended levels for fundamental nutrients suggesting that dietary guidance in addition to a dietary pattern more aligned with dietary guidelines may be beneficial for supporting healthy aging.

Exploring the link between allostatic load and mortality risk in U.S. Black men of different age groups*

Duane J. Wallace II, MPH[1] and Roland J. Thorpe, Jr., PhD
[1]Johns Hopkins University School of Medicine; [2]Johns Hopkins Bloomberg School of Public Health

ABSTRACT IMPACT: This research study will provide evidence for public policy, systemic changes, and other interventions to address the adverse impacts of prolonged stress exposure experienced by young Black men. OBJECTIVES/GOALS: Previous studies have demonstrated a strong association between allostatic load (i.e., stress-induced cumulative biological risk) and mortality in the Black American population. The aim of this study is to examine the association between allostatic load and mortality in Black men and to determine if the relation varies by age. METHODS/ STUDY POPULATION: Data from the third National Health and Nutritional Examination Survey (NHANES III, 1988-1994), linked to the 2015 National Death Index Public Release File, will be used for Black male adults 18 years or older. Allostatic load score includes nine biomarkers: albumin, C-reactive protein, total cholesterol, high-density lipoprotein, hemoglobin A1C, waist-to-hip ratio, systolic blood pressure, diastolic blood pressure, and pulse rate. The number of variables for which the participant's scores fall in the quartile of highest clinical risk are added together to create a summary score. Cox proportional-hazard analyses is employed to estimate the associations between allostatic load and all-cause mortality for the total sample and stratified by age, adjusting for selected characteristics. RESULTS/ANTICIPATED RESULTS: We hypothesize that the association of allostatic load with mortality will be greater among younger, compared to older, Black men. Young Black men (ages 25-44) are at particular risk of adverse impacts of chronic stress and allostatic load, due to their experience of chronic discrimination, systemic racism, racial battle fatigue, and mundane, extreme, environmental stress. Furthermore, the allostatic load-mortality association may be attenuated for older Black men due to a survival effect. DISCUSSION/SIGNIFICANCE OF FINDINGS: If the association between allostatic load score and mortality is stronger in young Black men, it would provide evidence for early identification of a group with high risk of premature mortality, and for public policy, systemic changes, and other interventions to address the adverse impacts of prolonged stress exposure experienced by young Black men.

Effects of Race and Demographics on Use of Physical Restraints in the Emergency Department

Ambrose H Wong, MD, MSEd, Travis Whitfill, MPH, Emmanuel C. Ohuabunwa, MD, MBA, Jessica M. Ray, PhD, James D. Dziura, PhD, Steven L. Bernstein, MD and Richard Andrew Taylor, MD, MHS
Department of Emergency Medicine, Yale School of Medicine

ABSTRACT IMPACT: Within three EDs in a regional health system in Connecticut, African American race, male gender, non-Hispanic ethnicity, lack of private insurance, and homelessness were associated with significant odds of being physically restrained during a visit. OBJECTIVES/GOALS: Agitated patient encounters in the Emergency Department (ED) are on the rise, and physical restraints are used to protect staff and prevent self-harm. However, these are associated with safety risks and potential stigmatization of vulnerable individuals. We aim to determine factors that are associated with odds of being restrained in the ED. METHODS/STUDY POPULATION: We conducted a retrospective cohort analysis of all patients (≥18 yo) placed in restraints during an ED visit to three hospitals within a large tertiary health system from Jan 2013-Aug 2018. We undertook descriptive analysis of the data and created a generalized linear mixed model with a binary logistic identity link to model restraint use and determine odds ratios for various clinically significant demographic factors. These include gender, race, ethnicity, insurance status, alcohol use, illicit drug use, and homelessness. Our model accounted for patients nested across the three EDs and also accounted for multiple patient visits. RESULTS/ ANTICIPATED RESULTS: In 726,417 total ED visits, 7,090 (1%) had associated restraint orders. Restrained patients had an average age of 45, with 64% male, 54% Caucasian and 29% African American. 17% had private insurance, 36% endorsed illicit substances, 51.4% endorsed alcohol use and 2.3% were homeless. African Americans had statistically significant odds of being restrained compared to Caucasians with adjusted odds ratio (AOR) of 1.14 (1.08,1.21). Females (AOR 0.75 [0.71, 0.79] had lower odds of being restrained compared to males while patients with Medicaid (AOR 1.57 [1.46, 1.68]) and Medicare (AOR 1.70 [1.57, 1.85]) had increased odds compared to the privately insured. Illicit substance use (AOR 1.55 [1.46, 1.64]), alcohol use (AOR 1.13 [1.07, 1.20] and homelessness (AOR 1.35 [1.14, 1.16]) had increased odds of restraint use. DISCUSSION/SIGNIFICANCE OF FINDINGS: We showed statistically significant effects of patient demographics on odds of restraint use in the ED. The increased odds based on race,

insurance status, and substance use highlight the potential effects of implicit bias on the decision to physically restrain patients and underscores the importance of objective assessments of these patients.

51152

Efficacy of Bimodal Visual-Olfactory Training in Patients with COVID-19 resultant Hyposmia or Anosmia Using Patient-Preferred Scents (VOLT Trial - Visual-OLfactory Training)

Amish Mustafa Khan, B.S., Dorina Kallogjeri, M.D., M.P.H. and Jay F. Piccirillo, M.D.
Washington University School of Medicine

ABSTRACT IMPACT: Olfactory dysfunction is a defining symptom of COVID-19 infection. As the number of total, confirmed COVID-19 cases approaches 7 million in the United States, it is estimated that there will be up to 500,000 new cases of chronically diminished smell. We offer a promising treatment. OBJECTIVES/GOALS: The primary aim is to explore the main effects and interaction of bimodal visual-olfactory training and patient-preferred scents on olfactory training in patients with post-COVID-19 hyposmia or anosmia. METHODS/STUDY POPULATION: The study will utilize a 2x2 factorial design. The two effects we will explore are unimodal versus bimodal training and conventional versus patient-preferred odors. All 4 arms will undergo 12 weeks of olfactory training. Participants will be assessed pre and post-intervention. Measurements of olfactory function include the objective smell identification test and subjective measures including the Clinical Global Impression Scale and Olfactory Dysfunction Outcomes Rating. Individuals eligible for the study include men and women between 18 and 70 years of age with olfactory dysfunction of at least 3 months duration initially diagnosed within 2 weeks of a COVID-19 infection. Of note, we will enroll nationally. RESULTS/ANTICIPATED RESULTS: We anticipate that the bimodal, patient-preferred scents training group will have the greatest improvement in smell scores, number of responders, and patient-reported sense of smell and health-related quality of life due to an additive interaction between the bimodal visual-olfactory and patient-preferred interventions. DISCUSSION/SIGNIFICANCE OF FINDINGS: The pathophysiology of COVID-19 olfactory dysfunction is mediated through damage to the peripheral and central olfactory pathways. This suggests that interventions most likely to be efficacious target both pathways, as olfactory training does.

57084

Combining artificial intelligence and robotics: a novel fully automated optical coherence tomography-based approach for eye disease screening

Ailin Song[1], Pablo Ortiz[2], Mark Draelos[1,2], Stefanie G. Schuman[3], Glenn J. Jaffe[3], Sina Farsiu[2,3], Joseph A. Izatt[2,3], Ryan P. McNabb[3], and Anthony N. Kuo[2,3]
[1]Duke University School of Medicine; [2]Duke University, Department of Biomedical Engineering; [3]Duke University, Department of Ophthalmology

ABSTRACT IMPACT: Despite its importance in systemic diseases such as diabetes, the eye is notably difficult to examine for non-specialists; this study introduces a fully automated approach for eye disease screening, coupling a deep learning algorithm with a robotically-aligned optical coherence tomography system to improve eye care in non-ophthalmology settings. OBJECTIVES/GOALS: This study aims to develop and test a deep learning (DL) method to classify images acquired from a robotically-aligned optical coherence tomography (OCT) system as normal vs. abnormal. The long-term goal of our study is to integrate artificial intelligence and robotic eye imaging to fully automate eye disease screening in diverse clinical settings. METHODS/STUDY POPULATION: Between August and October 2020, patients seen at the Duke Eye Center and healthy volunteers (age ≥18) were imaged with a custom, robotically-aligned OCT (RAOCT) system following routine eye exam. Using transfer learning, we adapted a preexisting convolutional neural network to train a DL algorithm to classify OCT images as normal vs. abnormal. The model was trained and validated on two publicly available OCT datasets and two of our own RAOCT volumes. For external testing, the top-performing model based on validation was applied to a representative averaged B-scan from each of the remaining RAOCT volumes. The model's performance was evaluated against a reference standard of clinical diagnoses by retina specialists. Saliency maps were created to visualize the areas contributing most to the model predictions. RESULTS/ANTICIPATED RESULTS: The training and validation datasets included 87,697 OCT images, of which 59,743 were abnormal. The top-performing DL model had a training accuracy of 96% and a validation accuracy of 99%. For external testing, 43 eyes of 27 subjects were imaged with the robotically-aligned OCT system. Compared to clinical diagnoses, the model correctly labeled 18 out of 22 normal averaged B-scans and 18 out of 21 abnormal averaged B-scans. Overall, in the testing set, the model had an AUC for the detection of pathology of 0.92, an accuracy of 84%, a sensitivity of 86%, and a specificity of 82%. For the correctly predicted scans, saliency maps identified the areas contributing most to the DL algorithm's predictions, which matched the regions of greatest clinical importance. DISCUSSION/SIGNIFICANCE OF FINDINGS: This is the first study to develop and apply a DL model to images acquired from a self-aligning OCT system, demonstrating the potential of integrating DL and robotic eye imaging to automate eye disease screening. We are working to translate this technology for use in emergency departments and primary care, where it will have the greatest impact.

62541

Continuity of Care for Patients with Chronic Gastrointestinal Disease: A Latent Class Analysis of Patients With High-Intensity Specialty Care Needs

Shirley Cohen-Mekelburg[1,2], Liberty Greene[2], Akbar Waljee[1,2], Tim Hofer[1,2], Sameer Saini[1,2] and Donna Zulman[2,3]
[1]University of Michigan; [2]VA Ann Arbor; [3]Stanford University

ABSTRACT IMPACT: Grouping patients with potentially high intensity specialty care needs based on their propensity for healthcare continuity patterns can inform the development of personalized care coordination and care navigation interventions OBJECTIVES/GOALS: To examine variation in healthcare continuity patterns across primary care, mental health care, and specialty care for a patient population with chronic gastrointestinal conditions and a high risk for healthcare utilization. METHODS/STUDY POPULATION: We analyzed data for Veterans Affairs patients with chronic gastrointestinal disease (cirrhosis, inflammatory bowel disease, chronic pancreatitis) whose 1-year hospitalization risk was ≥90th percentile in 2014, and who had a minimum of 4 office visits. To assess continuity, we examined frequency of office visits, number