

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)

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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

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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

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ABSTRACT IMPACT: Grouping patients with potentially high intensity specialty care needs based on their propensity for health-care 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 ≥ 90 th percentile in 2014, and who had a minimum of 4 office visits. To assess continuity, we examined frequency of office visits, number

of outpatient providers, and two established continuity of care measures (the usual provider of care index and the Bice-Boxerman continuity of care index) over 12 months. We used latent class analysis to categorize patients into classes based on overall, primary care (PCP)-specific, gastroenterology (GI)-specific, and mental health specific-healthcare continuity patterns. RESULTS/ANTICIPATED RESULTS: The 26,751 Veterans in the analytic cohort had a mean of 13.3 (sd 8.63) office visits and 7.2 (sd 3.83) providers per patient. Patients were classified into five phenotypes: (1) moderate overall use and continuity; (2) low overall continuity of care; (3) high GI- and PCP-specific continuity of care; (4) low overall continuity of care with some mental health use; and (5) high utilization with substantial mental health use. In the subsequent year, 11,259 (42.1%) patients had a hospitalization and 16,167 (60.4%) had an emergency department visit. These groups varied in their sociodemographic and clinical characteristics, and in their risk for hospitalization and emergency department use. DISCUSSION/SIGNIFICANCE OF FINDINGS: Latent class analysis revealed five distinct primary and specialty care utilization patterns. Grouping patients with high intensity specialty care needs based on their propensity for healthcare continuity patterns can inform the development of personalized care navigation interventions.

66919

Third trimester electronic cigarette use and the risk of preterm birth, low birthweight, and small-for-gestational age

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ABSTRACT IMPACT: Our study suggests that maternal e-cigarette use may reduce fetal growth and pose harm to newborns. OBJECTIVES/GOALS: Women are motivated to quit smoking during pregnancy. Many view electronic cigarettes (e-cigarettes) as a safer and healthier alternative to traditional tobacco smoke. We aim to determine the effect of third-trimester e-cigarette use on the risk of infant related outcomes. METHODS/STUDY POPULATION: We conducted a cross-sectional survey study using Pregnancy Risk Assessment Monitoring System (PRAMS). Women who gave live singleton births in 2016-2018 and at states that met response rate threshold criteria were included. Women were classified as never smokers, sole e-cigarette smokers, sole traditional cigarette smokers, and dual-users. Logistic regression was conducted to determine the association between third-trimester cigarette use and preterm birth (<37 weeks), low birth weight (<2,500 grams), and small for gestational age births (SGA, weight lower than the tenth percentile of the population). Analyses were weighted to account for the survey design and non-response. RESULTS/ANTICIPATED RESULTS: 94,539 women (weighted population of 4,765,290) were included. Compared with never smokers, third-trimester sole e-cigarette use increased the odds of preterm birth (Adjusted odds ratio [AOR]: 1.61, 95% confidence interval [CI]: 1.05, 2.48), low birthweight (AOR: 1.49, 95%CI: 1.06, 2.09), and SGA (AOR: 1.19, 95%CI: 0.71, 2.00), sole traditional cigarette use increased the odds of preterm birth (AOR: 1.36, 95%CI: 1.21, 1.52), low birthweight (AOR: 1.90, 95%CI: 1.72, 2.10), and SGA (AOR: 2.28, 95%CI: 2.05, 2.53); and dual use increased the odds of preterm birth (AOR: 1.17, 95%CI: 0.82, 1.67), low birthweight (AOR: 2.16, 95%CI: 1.58, 2.96), and SGA (AOR: 2.67, 95%CI:

1.97, 3.64). DISCUSSION/SIGNIFICANCE OF FINDINGS: E-cigarette use, by itself or in combination with traditional cigarettes, increases the risk of preterm birth, low birthweight, and SGA. Our study suggests that maternal e-cigarette use may reduce fetal growth and pose harm to newborns.

69350

Using Control Charts to Inform Public Health and Community Engagement during the COVID-19 Pandemic

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ABSTRACT IMPACT: Demonstrate applicability of an underutilized method for showing variation that enables public health agencies to respond to the COVID-19 pandemic OBJECTIVES/GOALS: Enacting sensible public policies in the coronavirus disease 2019 (COVID-19) pandemic requires real-time data that civic and public health leaders can easily interpret and act on. This collaboration between a CTSA and a local health department sought a novel use of control charts to provide timely and interpretable data. METHODS/STUDY POPULATION: Healthcare and other industries use control charts to understand the behavior of processes and systems so they can intervene on them. The CTSA science team developed statistical process control charts at the neighborhood level to help illustrate their value for decision-making as the pandemic progresses. This method included accounting for congregate populations (skilled nursing facilities, correctional facilities) to produce data for the general public. RESULTS/ANTICIPATED RESULTS: Patterns in COVID-19 vary over time by neighborhood. Juxtaposing control charts with social characteristics of local areas in a dashboard format provides granularity for decision-makers and data for engaging communities in changing behavior. Annotating time series charts in real time connects events and local knowledge with observed data, which can help authorities and people to learn and act based on variations displayed by the control charts about disease outbreaks and cases. School districts are among those that could benefit from control charts with information about the school community and how COVID-19 spread is occurring. DISCUSSION/SIGNIFICANCE OF FINDINGS: Control charts have rarely been used in public health despite their ease of use and interpretability. This study demonstrates a novel approach to providing timely, accurate data that can support real-time decision-making of government and public health as well as school districts, businesses, and others.

69567

Association between area deprivation index and long-term diabetic complications in a population of diabetic patients'

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ABSTRACT IMPACT: To improve care and services for patients with chronic disease, health systems are focusing on evaluating social