higher in the ICI cardiotoxicity group (6.8 ±4.2 vs. 1.0 ±1.7, p=0.017). The proportion of abnormal myocardium was higher in the ICI cardiotoxicity group (66 ±21% vs. 45 ±18%, p=0.050), as well as the proportion of myocardium found to be dysfunctional (26 ±22% vs. 3.0 ±6.0%, p=0.041). DISCUSSION/SIGNIFICANCE OF FINDINGS: Despite having preserved LVEF, patients who met criteria for ICI-associated cardiotoxicity had both global and regional abnormal LV strain. Fast-SENC imaging may provide a sensitive tool for detection of early cardiotoxicity in this population. This study is limited by its small cohort and a larger prospective study would be of value.

65993

Peptide Conjugated Hollow, Degradable Nanoparticles Bind to Exposed Hyaluronic Acid for the Prevention and Treatment of Osteoarthritis

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ABSTRACT IMPACT: Our research would be the first therapeutic to both prevent and treat osteoarthritis - helping 27 millions U.S. citizens alone immediately. OBJECTIVES/GOALS: Our objective is to conjugate hyaluronic acid binding peptides (HABP) to anionic hollow nanoparticle (hNP), and allowing the HABP-hNP complex to penetrate into osteoarthritic cartilage, bind to exposed HA, prevent further degradation, and restore the compressive strength of articular cartilage. METHODS/STUDY POPULATION: N-isopropyl acrylamide, 2-acrylamindo-2-methyl-1-propanesulfonic acid, N,N'-bis (acryoyl)cystamine, and Acrylic Acid, in fluorescent batches rhodamine b isothiocyanate (RBITC), were polymerized via precipitation reaction. HA binding peptide, GAHWQFNALTVRGSG-Hydrazide (GAH-Hyd), was covalently bonded to the hNP using DMTMM chemistry. The reaction was halted by diluting the solution 10:1 with milliQ water and purified using tangential flow filtration. The dynamic viscosity of the six treatments were analyzed in a 70 kDa HA. Using a rheometer (Discovery HR-3) with a 20 mm parallel plate geometry, TA Instruments, New Castle, DE), a frequency sweep (0.01 -1000 Hz, 2.512 Pa) was conducted to measure the storage modulus of each solution. RESULTS/ANTICIPATED RESULTS: GAH-Hyd was successfully conjugated to the surface of the hNP and zeta-potential shows a significant increase in surface charge from -21.41 mV for unconjugated hNP to -8.94 mV for 65 GAH conjugated hNP, confirming conjugation. The hNPs need 65 ±10 GAH per nanoparticle to significantly bind to HA, shown by increasing the dynamic viscosity of the solution. The minimum concentration of 65 GAH-hNP required to significantly bind to HA is 313 μM. These data from our study display the ability to functionalized the surface of polymeric hNPs with site specific peptides and their ability to bind to diseased tissue. We expect the GAH-hNP system will restore the compressive strength of OA cartilage and prevent further HA degradation in ex vivo aggrecan depleted cartilage plugs. DISCUSSION/SIGNIFICANCE OF FINDINGS: Binding to exposed HA within the ECM of cartilage protects the HA from further degradation, halting the progression of OA. 65 GAH-hNP binds to HA at a 313 μM. Our system can be translated and used to treat a multitude of conditions by conjugating tissue specific peptides to the surface of our hNPs and delivery site specific therapeutics to diseases tissue.

Regulatory Science

19751

Identifying Barriers to Diabetes Technology in Low-Income, Type 1 Patients

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ABSTRACT IMPACT: This research will aid clinical and policy solutions on lessening the vast health disparities and overall access issues for low-income, type 1 diabetes patients. OBJECTIVES/GOALS: Identify key barriers to accessing continuous glucose monitors (CGMS) and care options for low-socioeconomic status (SES) patients on public insurance. Low-SES patients with type 1 diabetes (T1D) have lower utilization rates of effective diabetes management technologies and worse clinical outcomes. METHODS/STUDY POPULATION: A literature review was conducted to understand the current research landscape for T1D and lead to the identification of potential barriers which included socioeconomic status, low-income, health literacy, and racial/ethnic minority. Clinicaltrials.gov was searched using the keyword 'type 1 diabetes' in conjunction with the identified barriers (as well as the keyword 'barrier'). A follow up review of each state's Medicaid programs was conducted to analyze cost and access options for CGMs and the overall financial burden of the disease on low-SES T1D patients. States that offered CGM coverage were further analyzed to determine reimbursement rates and actual out-of-pocket cost for patients. RESULTS/ANTICIPATED RESULTS: Of 285 trials identified from Clinicaltrial.gov searches, only seven relevant trials examined barriers and T1D for low-SES patients. Additionally, many of these studies, both in and outside of the clinical trial space, seldom distinguished between type 1 and type 2 diabetes‟ an important distinction given that T1D has a higher financial burden and a quicker onset of complications. Currently, 39 states offer various insurance coverage through their Medicaid programs, but have clinical restrictions and requirements such as pediatric coverage only or minimum blood glucose requirement checks. Additionally, there is vast variability in reimbursement rates between states ($0-$800). DISCUSSION/SIGNIFICANCE OF FINDINGS: Study results indicate less effective diabetes management for low-SES T1D patients and a need for more intersectional clinical trial research. Differences in state's Medicaid CGM coverage, expressed in disparate clinical outcomes for these T1D patients, belies financial incentives to health improvements, as annual US T1D costs are $14.4 billion.

67702

At-Home Screening Tool for Anosmia

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ABSTRACT IMPACT: By developing and validating a simple and cost-effective at-home screening tool for loss of smell, we can efficiently detect infection with COVID-19, neuropsychiatric disease such as Alzheimer's, and post-operative smell loss. OBJECTIVES/GOALS: To develop and validate a feasible and cost-effective screening tool for olfactory dysfunction (OD) using common household items. METHODS/STUDY POPULATION: The study has two phases. In the Development phase, 120 participants with

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self-reported smell changes will complete a survey with a list of 45 household items to smell. Item reduction to develop the NASAL Short Smell Test will occur by measuring content validity, factor analysis, and internal consistency. In the Validation phase, 200 participants with self-reported smell changes will take the NASAL Short Smell Test at baseline and again at three weeks. In both phases, the validated University of Pennsylvania Smell Identification Test (UPSIT) will be used as the gold standard. Measures of performance as well as test-retest reliability and sensitivity to change will be measured. RESULTS/ANTICIPATED RESULTS: We anticipate that the majority of participants will have at least half of the items in their household and will report ability to smell for each. Measures of sensitivity, specificity, likelihood ratios, and UPSIT score correlations will allow us to evaluate performance of each item. Item reduction will allow us to create the NASAL Short Smell Test, in which a handful of common items will be used to create a screening tool for smell loss. The Validation phase will allow us to measure discriminative performance of this tool as well as test-retest reliability and sensitivity to change, which we expect to be at least comparable to the validated UPSIT. DISCUSSION/SIGNIFICANCE OF FINDINGS: Current tools for diagnosis of OD are costly, time-consuming, and often require a clinician to evaluate. The validation of the simple at-home NASAL Short Smell Test to screen for OD will allow us to detect infection with COVID-19, neuropsychiatric disease, or post-operative smell loss quickly and efficiently.

Team Science

18069

WISE Indiana (Wellbeing Informed by Science and Evidence in Indiana) - A state-university partnership response to the pandemic

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ABSTRACT IMPACT: The WISE Indiana COVID-19 project facilitates rapid response and access to relevant and emerging evidence-based information for state personnel, healthcare providers and systems, managed care entities, community organizations, and all others involved in a professional capacity with the pandemic response. OBJECTIVES/GOALS: The COVID-19 project was developed to assist in responding to the Indiana Department of Health's need for rapid and evidence-informed responses to complex questions about the pandemic and best practices for preventing, mitigating, monitoring and recovering from the COVID-19 global pandemic. METHODS/STUDY POPULATION: The WISE Indiana team was activated to assist in managing the project and immediately connected with university research librarians. Through our established networks, we were able to quickly engage academic researchers and clinicians across the state to rapidly respond to key questions about COVID-19 from government leadership. Research librarians added their expertise by conducting comprehensive searches of evidence-based clinical, public health, policy, and law literature and writing up detailed annotated bibliographies. Academic experts were also recruited to write daily summaries of emerging COVID-19 literature for the benefit of Indiana's frontline responders and build and maintain an online repository of evidence-based learning materials for practitioners on the front lines. RESULTS/ANTICIPATED RESULTS: This work has informed key decision-making at many levels of Indiana's COVID-19 response. Examples include data modeling for the IN.gov COVID-19 Dashboard, the allocation of Remdesivir, decisions about resuming elective procedures, and strategies for scaling back mitigation efforts. The WISE Indiana team has been able to engage over 40 academic experts from across the state of Indiana with expertise in pulmonary, infectious disease, law, epidemiology, mental health, public health, policy, and communications to assist in responding to key questions posed by government leadership and writing summaries of emerging COVID-19 literature which is summarized and accessible through our website: https://indianactsi.org/community/monon-collaborative/covid-19/. DISCUSSION/SIGNIFICANCE OF FINDINGS: The bidirectional exchange of information through the WISE Indiana collaborative network enable our team to quickly pivot to respond to the needs of our government leadership. Our team was able to rapidly translate the evidence-based information in order to respond to the policy and health outcomes needs of the state's response to the global pandemic.

99391

A TL1 Team Approach: The Role of Parents in Physical Activity Engagement Among Adolescents with Comorbid Asthma and Obesity

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ABSTRACT IMPACT: Our research highlights the need for both parental and clinical support to promote PA engagement among higher risk youth with comorbid asthma and obesity; these findings will inform research and clinical efforts in the youth development, prevention science, and clinical psychology fields. OBJECTIVES/GOALS: Asthma incidence doubles in youth with obesity. Physical activity (PA) is beneficial for asthma management; however, parental influence on PA levels among youth with asthma and obesity is poorly understood. This study examines the association of parents and PA among youth with asthma and/or obesity, accounting for risk and protective factors. METHODS/STUDY POPULATION: Data from 5th, 8th, 9th, and 11th-graders were obtained from the 2019 Minnesota Student Survey (N=96,820). Linear regressions examined the impact of parent connectedness on PA across 4 groups (neither asthma nor obesity [OB], asthma only, OB only, comorbid asthma/OB). The p-value for significance was set at $p<.001$. For PA, youth reported how many days they were physically active (≥60 min/day) in the last week. Two items assessing youth perception of parent care and ability to talk to parents about their problems were used to measure parent connectedness. BMI was calculated using self-report height/weight, age, and gender. Control variables included age, race/ethnicity, and free/reduced lunch eligibility. Models 2-4 retained parent connectedness variables and added risk and protective factors. RESULTS/ANTICIPATED RESULTS: In Model 1, both parent variables significantly predicted PA for each risk group (β ranges: parent care=.07-.09; parent talk=.04-.05, $p<.001$), except for the asthma/OB group (parent talk: $p>.001$). Models 2 and 3 added risk factors. Depression was the most salient risk factor, particularly for the highest risk group (asthma/OB; $\beta = -.13$, $p<.001$). Safe neighborhood was positively associated with PA for all groups ($\beta s = .05$, $p<.001$) except the asthma/OB group ($p>.001$). In Model 4, extracurricular activity involvement (protective factor) was

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