nucleotide polymorphisms within CASKallow for allele specific analysis of our targeted reactivation. We anticipate that following an increase of CASK expression, there would be a decrease in region specific promoter methylation. Further, with the identification of clinically described disease-causing point mutations that result in a loss of function of CASK protein, induction of the mutant sequence onto a healthy cell background will result in a similar reduction of CASK protein in our cell model. DISCUSSION/SIGNIFICANCE: This project will demonstrate the first therapeutic avenue for CASK-related MICPCH, and the potential to utilize targeted X-reactivation as a platform approach for X-linked disorders. Further, investigation of smaller dCas9 orthologues prepares our approach for future translational applications such as packaging into AAV for delivery.

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Clinical and Translational Research at The University of Florida College of Veterinary Medicine

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OBJECTIVES/GOALS: To demonstrate a successful example of clinical and translational research at a busy veterinary teaching hospital and highlight a collaborative effort in Comparative Oncology between the University of Florida's (UF) Colleges of Medicine and Veterinary Medicine. METHODS/STUDY POPULATION: The UF College of Veterinary Medicine (CVM) is a full-time teaching hospital with multiple departments actively recruiting patients for clinical trials. These departments include but are not limited to Oncology, Internal Medicine, Dermatology, Cardiology, and Emergency and Critical Care. The Oncology department collaborates with the doctors at the UF Health Cancer Center (UFHCC) as part of a Comparative Oncology Initiative, which has many ongoing canine and feline trials focusing on immunotherapy. RESULTS/ANTICIPATED RESULTS: As of August 2023, there are 60 clinical trials actively recruiting and enrolling patients at the UF CVM. 57% of these trials are interventional studies, while the other 43% are observational studies. The UFHCC Comparative Oncology Initiative has successfully completed one clinical trial focusing on canine gliomas; has 4 clinical trials that are actively recruiting patients, and 6 trials that are opening for enrollment in the near future. These studies focus on osteosarcoma, melanoma, and squamous cell carcinoma. It is anticipated that with continued successful collaborations, more clinical trials will be possible, and new treatment options will become available for not only veterinary patients but human patients as well. DISCUSSION/SIGNIFICANCE: Clinical and translational research is an important part of veterinary medicine to further patient care. Due to ongoing collaborative efforts, not only veterinary patients but also human patients will benefit from the research being conducted at the UF CVM.

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Implementation of COPD Clinical Practice Guidelines with Use of Telehealth

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OBJECTIVES/GOALS: Studies to improve uptake of Chronic Obstructive Pulmonary Disease Clinical Practice Guidelines (COPD CPG) have yielded inconsistent results. We hypothesized that using implementation science would facilitate rigorous site 'diagnosis', and promote effective contextual tailoring of COPD CPG, while piloting the use of telehealth for this. METHODS/STUDY POPULATION: The study was conducted in two Veterans Affairs primary care clinics located in a small sized city. A detailed formative evaluation was conducted using key informant interviews (with VA staff and veterans with COPD who received care at this location) and quantitative data. Multidisciplinary stakeholder group was engaged and strategies to address the determinants identified through the previous step were identified. Telehealth was strongly encouraged as the primary modality for implementing the COPD CPG and we are collecting pilot data on this. Tele-Facilitation, used as the meta-strategy was employed in conjunction with other strategies such as develop/distribute educational materials, tailor strategies, change record systems and revise professional roles. RESULTS/ANTICIPATED RESULTS: Primary Care at the VA is provided by Patient Aligned Care Teams (PACT-teams), where each team consists of multiple health professionals to provide collaborative care to the patient. Discussions with the multidisciplinary stakeholder team suggested that any implementation effort primarily focused on physician and nursing efforts was unlikely to succeed due to competing demands. A pharmacy-centric model that allowed for the PACT-team clinical pharmacist to address most of the COPD CPG (inhaler technique education/assessment, inhaler choice optimization, COPD-specific patient education, spirometry use, smoking and immunization) was developed and implemented with incorporation of telehealth (video visits and telephone). We will present pilot implementation outcomes using RE-AIM framework elements. DISCUSSION/SIGNIFICANCE: This use of implementation science to implement COPD CPG and novel use of telehealth has enormous potential for impact. Increasing reach/adoption by targeting primary care practices can help permeate quality care to the underserved population. This data will allow us to explore generalizability through wider scale implementation studies.

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The Effect of a Culturally-tailored and Theory-based Resistance Exercise Intervention on Motivation, Self-Regulation, and Adherence in Young Black Women*

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OBJECTIVES/GOALS: Black women participate in the least amount of physical activity in the U.S., and determining methods to increase

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motivation and consistent exercise are warranted. Purpose: This study assessed differences in psychological and behavioral outcomes in young Black women in a culturally-tailored and theory-based resistance exercise (RE) study. METHODS/STUDY POPULATION: Women (M= 22.7 ± 3.6y) were randomized to the standard exercise group (SEG; n= 6) or motivational exercise group (MEG; n= 8), and completed 10 weeks of RE with a Black woman trainer and 11 weeks of unsupervised RE. The MEG discussed and received text messages about exercise education, self-regulation, autonomy, and competence. Motivation was measured by the Behavioral Regulation in Exercise Questionnaire-3, the Physical Activity Self-Regulation Scale-12 measured self-regulation, and the Basic Psychological Needs in Exercise Scale measured competence, autonomy, and relatedness. Adherence was calculated as # of completed/total sessions, and retention was the percent of women who completed ≥2 days/week of unsupervised RE. An ANOVA and Bonferroni post hoc analyses were used to determine significant findings. RESULTS/ANTICIPATED RESULTS: Significant time effects were found for intrinsic motivation (Λ = .691, F [11, 2]= 17.494, p< .001), basic psychological needs (Λ = .951, F [11, 2]= 22.691, p< .001), and self-regulation (Λ = .881, F [10, 2]= 40.942, p< .001), but no main interactions. Significant increases occurred from pre-testing to 3-mo follow-up for intrinsic motivation (pre: 1.80 ± .90 vs 3mo: 2.71 ± .63, p= .002), competence (pre: 1.98 ± .93 vs 3mo: 3.55±.81, p< .001), autonomy (pre: 2.14 ± .75 vs 3mo: 3.81 ± .74, p< .001) relatedness (pre: 2.78±1.60 vs 3mo: 4.32 ± .58, p< .001), and self-regulation (pre: 18.4 ± 2.88 vs 3mo: 33.79 ± 3.11, p< .001). Adherence rates for both groups were 93%. Retention rates were 33% for SEG and 25% for MEG. MEG had 38% complete RE 1 day/week opposed to none in SEG. DISCUSSION/SIGNIFICANCE: Ten weeks of culturally-tailored, supervised RE showed efficacy in significantly increasing motivation and behavioral practices to help sustain exercise. Future research should further explore strategies to use during unsupervised training to help increase exercise adherence in young Black women.

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Investigating the impact of bariatric surgery on metabolic mechanisms that promote obesity-associated inflammation in subjects with and without Type 2 Diabetes

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OBJECTIVES/GOALS: This project will provide novel insights into mechanism(s) by which differences in inflammation develop & resolve, or fail to resolve, in metabolically different groups of bariatric surgery patients determined by Type 2 Diabetes status. My work may uncover unique differences between cohorts, encouraging development of personalized medicine. METHODS/STUDY POPULATION: I analyzed human blood samples collected before and 3, 6, & 12 months after bariatric surgery at the University of Kentucky through an established tissue bank. Subjects hadnormal glucose tolerance, pre-diabetes, or Type 2 Diabetes, based on HbA1c%. Iisolated peripheral blood mono nuclear cells & will comparecytokine profiles among cohorts across all time points. I will define & perturbmetabolic differencesin immune cells among cohorts & across time via isotope tracing, fuel source limitation, and metabolite inhibition. This will determine causal relationships between cytokine profiles & immune cell metabolism. RESULTS/ANTICIPATED RESULTS: I anticipatecytokine profiles, a functional output of immune cells, will differ among cohorts pre-surgery, and that this difference will diminish post-surgery. Differencesmay be insignificant by the 12 month time point. I also anticipate differences in fuel usage and metabolite productionin immune cells among cohorts pre-surgery, and that these differences only partially resolve post-surgery to poise immune cells for continued chronic inflammatory action. I hypothesize that T2D status has a lasting impact on immune cell function and fuel usage patterns, and will continue to supportchronic inflammation following short term T2D remission and longer-term weight loss. DISCUSSION/SIGNIFICANCE: There has been an alarming increase in obesity and its comorbidities over recent decades, and inflammation is a known supporter of T2D. The anticipated rewiring of immune cell metabolism post-surgery, if incomplete, may poise subjects forweight regain and T2D recurrence.

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Point-of-Service Salivary Microbiome Analysis in the Prevention and Detection of Oral Premalignant Lesions

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OBJECTIVES/GOALS: Our aim is to establish soluble salivary biomarkers indicative of increased risk of oral premalignancy to be used in a point-of-service technology. Our goal is to non-invasively assess risk level for premalignancy by characterizing a molecular signature pattern that can be applied to such a diagnostic tool at routine dental or medical visits. METHODS/STUDY POPULATION: Adult patients 18 years of age and older who are non-smokers and patients of the University of Maryland School of Dentistry Oral Medicine Clinic and have been diagnosed with oral premalignancy (proliferative verrucous leukoplakia) are eligible. Exclusion criteria include history of immunosuppression or immune compromise; use of antifungal, antibiotic, and/or antiviral medications within the past three months; and gross dental disease. Serial unstimulated saliva samples will be collected at baseline or diagnosis of oral premalignancy, 6 months and 12 months. Solubility testing will be completed to determine whether malignant markers such as EGFR/mTOR/PI3K/p53 are soluble in saliva, and patient samples will be analyzed by ELISA and compared to appropriate controls. RESULTS/ANTICIPATED RESULTS: We anticipate demonstrating increased activity of molecular pathways known to be involved in malignant transformation, such as EGFR/mTOR/PI3K/p53, or increased burden of select microbial pathogens to be associated with increased risk of oral premalignancy in the form of proliferative verrucous leukoplakia. Preliminary sensitivity and specificity testing of the identified markers will provide additional insight to the utility of a diagnostic tool with salivary specimen. Therefore, the microbiome and/or molecular profile proposed from these results will serve as a translational application to development of future point-of-service test devices to be used in the prevention and detection of oral premalignant lesions. DISCUSSION/SIGNIFICANCE: Oral cancer is the sixth most common cancer worldwide, and presents challenges in its diagnosis and clinical management. Later diagnosis is associated with poorer patient outcomes—therefore, a molecular and microbiome profile that may be used in a noninvasive diagnostic test technology would prove beneficial to providers and patients.

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