

objective of the proposed study is to assess the effect of administering a prebiotic, such as HAMS-AB, on the gut microbiome profile, SCFA production, glycemia and β -cell function in humans with T1D. **METHODS/STUDY POPULATION:** We hypothesize that administration of HAMS-AB will (i) improve the gut microbiome profile in humans with T1D, (ii) increase SCFA production, and (iii) improve β -cell health, β -cell function and overall glycemia. We propose a pilot randomized controlled cross-over trial of HAMS-AB in 12 youth with newly-diagnosed T1D. We will use state-of-the-art markers to profile the gut microbiome (using 16S rRNA sequencing), measure stool SCFA levels (using gas chromatography), assess β -cell stress/death (by measuring proinsulin to C-peptide ratios) and glycemia (assessed by continuous glucose monitoring and HbA1c measurements). **RESULTS/ANTICIPATED RESULTS:** We expect that the use of HAMS-AB in newly diagnosed youth with type 1 diabetes will alter the gut microbiome profile (thus increasing the number of fermenters and SCFA levels), β -cell function and glycemia in humans with T1D. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Given the unknown long-term effects of immune-modulatory therapy on those at risk for or those diagnosed with T1D, the use of a prebiotic such as HAMS-AB offers a simple, safe, yet inexpensive and tolerated dietary alternative approach to mitigating disease.

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Examining the Effects of A Hybrid Communication Coaching Intervention on Fathers' Responsive Strategy Use with Children with Autism Spectrum Disorder

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OBJECTIVES/GOALS: This investigation aimed to mitigate barriers to father involvement in communication intervention for children with ASD and contribute to clinical practice by examining the effects of a hybrid parent coaching intervention for fathers of children with ASD that is tailored to fit both father's interaction and communication styles as well as individual child characteristics. The Hybrid Father Communication Coaching (HFCC) combined online parent coaching lessons with in-person father-child aquatics sessions in order to increase father's use of responsive verbal and play strategies. Distal effects on child communication were also investigated. **METHODS/STUDY POPULATION:** A single subject, multiple baselines across strategies experiment was conducted with one dyad (i.e., father, child with ASD). In the present study, a hybrid father coaching model was used. Parent communication coaching sessions were delivered online, and weekly, father-child aquatics sessions were conducted in person, to provide opportunities for the father to use three targeted responsive strategies (i.e., follow-in comments, follow-in directives, responsive object play) during father-child physical activity. Collateral measures of child communication skills were also investigated. Single subject designs are particularly suitable for autism interventions, as they allow for experimental control with participants who are from heterogeneous populations (McReynolds and Kearn, 1983). The child participant was 5 years, 6 months at the start of intervention and had previously received a community diagnosis of ASD. Throughout the duration of the study, the child attended full-time kindergarten and received in-school speech-language therapy, as well as 18-20 hours per week of Applied Behavioral Analysis intervention, occupational therapy, physical therapy and speech-language therapy after school. The participating father was a biological parent who resided with the child

continuously since birth. The participating father had no other formal parent training in communication intervention before participating. **RESULTS/ANTICIPATED RESULTS:** The hybrid father communication coaching program (HFCC) yielded positive results for both father and child participant. The father quickly achieved a high level of competency using two of the three, targeted strategies (i.e., follow-in comments, follow-in directives). However, use of a third strategy (i.e., responsive object play) was not maintained above baseline levels. The follow-in comments strategy was used by the participating father more frequently than the follow-in directives strategy. Small increases were documented for child use of spontaneous single words across intervention phases and increased single word use over was maintained eight weeks following intervention. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The present study provided information regarding the efficacy of a clinically relevant hybrid parent-coaching program, tailored to both father and child characteristics, to enhance fathers' use of responsive strategies and increase communication skills for children with ASD.

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Exploratory evaluation of an online educational intervention for JUUL use

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OBJECTIVES/GOALS: Initiation of JUUL use by young adults is one of the most significant issues of concern within the debate on vaping. Despite the proliferation of products and the surge in prevalence, no studies have investigated individual-level interventions or prevention strategies for pod-mod use. **METHODS/STUDY POPULATION:** Participants ($N = 947$) were young adults (<30 years old) recruited from Amazon's Mechanical Turk based on smoking (never, former, and current smokers) and JUUL use status (never and current users), resulting in 6 use groups. In a pre-post design, participants completed baseline assessments, were presented with a brief JUUL-specific educational intervention, and completed post-assessment measures. The one-page intervention provided basic information about JUUL and stated that JUUL is harmful to non-smokers but could be beneficial to smokers if they completely switch. Primary outcomes were changes in JUUL knowledge, perceived harmfulness, intentions for future use, and motivation to change. **RESULTS/ANTICIPATED RESULTS:** Participants ($M_{age} = 26.1$) were male (57%) and White (75%). Overall, the intervention increased JUUL-related knowledge, risk perceptions, commitment to quitting, and readiness to quit JUUL ($ps < .01$). Similarly, participants showed decreased interest in future JUUL use, interest in purchasing JUUL, and interest in future regular use ($ps < .01$). Non-JUUL users showed decreased interest in initiating JUUL use after viewing the intervention ($p < .01$). There were significant Time X Group interactions for JUUL-related knowledge ($p < .001$), with never JUUL/never smokers showing the greatest increase in product knowledge following the intervention. However, no other interaction effects were significant. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The intervention was effective in increasing knowledge and risk perceptions while reducing intentions for future use. The intervention was most effective in increasing knowledge among non-users, suggesting that brief educational interventions may be useful tools for preventing pod-mod initiation. **CONFLICT OF INTEREST DESCRIPTION:** Dr.

Carpenter has received consulting honoraria from Pfizer. All other authors have no conflicts to disclose.

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Exploring Physician Investigator Clinical Trials Training and Quality Management Systems and its Implementation in Medical School Curriculums

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OBJECTIVES/GOALS: Although many physicians conduct clinical trials as Principle Investigators, a systematic training is often lacking. Instead, most receive on-site training, potentially compromising data quality and human subject safety. This research assesses the landscape for physician training through medical school curriculums. **METHODS/STUDY POPULATION:** This project explored training programs for physician researchers, specifically in the emerging field of quality management systems (QMS). To understand the scope of academic research available for QMS and Good Clinical Practice (GCP) training and lack of clinical trial training implemented in medical school curricula, a literature review was conducted. Available training for physicians was assessed through existing training programs from the FDA, NIH, DIAMOND, ACRP, and Google for accessibility in terms of costs, completion timelines and certification, format (online vs. in-person), and inclusion of GCP and QMS training in the curriculum. **RESULTS/ANTICIPATED RESULTS:** Literature review revealed that not much is known about physician researcher training beyond the institutional requirement for minimal GCP review. Examination of select medical school curriculum also discovered a lack of clinical trial training for students interested in clinical research. Furthermore, existing training programs and modules available for physicians are limited as their syllabi do not include QMS training. In addition, these programs commonly have inaccessible registration links, are expensive, and have significant time commitments for in-person courses. These findings support the need for more accessible and effective training and certification tools for physician researchers. **DISCUSSION/SIGNIFICANCE OF IMPACT:** QMS training is not included in medical school curricula or programs for physician researchers, potentially compromising data integrity and subject protection. This research supports the development of essential QMS training concepts and practical approaches for physician researcher clinical trials.

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Glycemic control in a weight management-focused group medical visits (WM/GMV) intervention: examining the moderating effects of body mass index (BMI)

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OBJECTIVES/GOALS: The impact of baseline BMI on glycemic response to group medical visits (GMV) and weight management (WM)-based interventions is unclear. Our objective is to determine how baseline BMI class impacts patient responses to GMV and interventions that combine WM/GMV. **METHODS/STUDY POPULATION:** We will perform a secondary analysis of Jump Start, a randomized, controlled trial that compared the effectiveness of a GMV-based low

carbohydrate diet-focused WM program (WM/GMV) to traditional GMV-based medication management (GMV) on diabetes control. The primary and secondary outcomes will be change in hemoglobin A1c (HbA1c) and weight at 48 months, respectively. Study participants will be stratified into BMI categories defined by BMI 27-29.9kg/m², 30.0-34.9kg/m², 35.0-39.9kg/m², and ≥40.0kg/m². Hierarchical mixed models will be used to examine the differential impact of the WM/GMV intervention compared to GMV on changes in outcomes by BMI class category. **RESULTS/ANTICIPATED RESULTS:** Jump Start enrolled 263 overweight Veterans (BMI ≥ 27kg/m²) with type 2 diabetes. At baseline, mean BMI was 35.3 and mean HbA1c was 9.1. 14.5% were overweight (BMI 27-29.9) and 84.5% were obese (BMI ≥ 30). The proposed analyses are ongoing. We anticipate that patients in the higher BMI obesity classes will demonstrate greater reductions in HbA1c and weight with the WM/GMV intervention relative to traditional GMV. **DISCUSSION/SIGNIFICANCE OF IMPACT:** This work will advance the understanding of the relationship between BMI and glycemic response to targeted interventions, and may ultimately provide guidance for interventions for type 2 diabetes.

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Identification of the most salient risk factors of preterm birth in the US using geospatial mapping[†]

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OBJECTIVES/GOALS: Preterm birth is the most common birth complication in the United States. To date, there are no effective public health strategies to reduce the burden of prematurity. Using geospatial information system (GIS) mapping, we identified the most salient risk factors of preterm birth across US counties targetable for future interventions. **METHODS/STUDY POPULATION:** Risk factors of preterm birth were identified from the perinatal health nonprofit organization, March of Dimes, and included factors such as obesity, smoking, insurance coverage and poverty. US 2013 county-level data on sociodemographic characteristics, behavioral risk factors and preterm birth were extracted and combined from the American Census, Center for Disease Control, and US Health Resources and Services Administration. Spatial autocorrelation and multivariate spatial regression were used to determine the risk factors most strongly associated with preterm birth. These models were adjusted for race, given well-documented race disparities for preterm birth. As a case-study comparison, we mapped risk factors in the two states with the highest and lowest proportion of preterm births in 2013. **RESULTS/ANTICIPATED RESULTS:** In our preliminary analysis, obesity was the factor most strongly associated with preterm birth ($\beta = 7.32$, SE: 1.13, $p < 0.001$) at the US county-level. Surprisingly, smoking was not found to be significantly associated with preterm birth. In 2013, Vermont had the lowest prevalence of preterm birth at 7.6% and Mississippi had the highest prevalence of preterm birth at 13.1%. Health insurance coverage and obesity were the two risk factors that differed between Vermont and Mississippi. The median proportion of uninsured individuals in Mississippi counties was four times higher than that of Vermont counties (26.3% vs 10.9%, $p < 0.01$). Similarly, the median obesity prevalence in Mississippi counties was significantly higher than the median obesity prevalence in Vermont counties (38.8% vs. 25.2%). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Public health efforts aimed at reducing obesity and increasing health insurance coverage may have the greatest impact at addressing the US burden of preterm birth. Further, geospatial mapping is a powerful