cutaneous SSc, and 53% were within 7 years of diagnosis. Participants reported cognitive challenges affecting short-term memory, attention, and processing speed. They highlighted the need for flexible online sessions (having multiple time options to choose from), extra time for discussion, and peer support (a space for connection and group discussion). Barriers to participation included symptom fluctuation, fatigue, and limited time. Facilitators included peer support and user-friendly resources. These insights will refine a conceptual model to guide development of an intervention that is acceptable, feasible, and tailored to the cognitive and lifestyle needs of people with SSc. DISCUSSION/SIGNIFICANCE OF IMPACT: We will incorporate feedback from this study to create a patient-centered cognitive rehabilitation intervention that is tailored to people with SSc. Involving people with SSc in intervention development provides the foundation to build a robust, relevant intervention for people with cognitive challenges.

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Understanding community engagement with research through a curated medical record-based database: A cross-sectional, single site study

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OBJECTIVES/GOALS: Since clinical trial participation is a key translational research initiative, the objectiveis to characterize research participants within a health system using electronic health record (EHR) data and evaluate how community-level factors influence research participation rates. METHODS/STUDY POPULATION: Retrospective, cross-sectional study of patients with ICD-10 research encounter codes (Z00.6) from 2016 to 2024 using Rush EHR data organized in the CAPriCORN Common Data Model. Research participation prevalence was the main outcome, calculated by geographic area (3-digit zip codes, Chicago community areas) and linked to Census data for neighborhood factor analysis. Variables include Area Deprivation Index (ADI), Social Vulnerability Index (SVI), education, occupation, and income. The Chi-square test compared demographics and t-tests compared mean SDOH variables between high- and low-participation community areas. RESULTS/ANTICIPATED RESULTS: Of the 1,069,226 patients seen from 2016 to 2024, 11,937 patients had research visits. Of these patients, 45.4% lived in Chicago, 65 years or above is the largest age group (29%), 62% female, 58% White, 82% non-Hispanic, and 9% non-English preferred language. Overall, the research participation prevalence was 1.12%, higher outside of Chicago (1.21%) than within (1.03%). Within Chicago community areas, prevalence ranged from 0.34% to 2.8% (mean: 1.03%, SD: 0.44%). Higher-participating communities (above median) had significantly lower ADI (39.9 vs 61.9), lower SVI (0.51 vs 0.80), lower unemployment (8.0% vs 15.3%), higher bachelor's degree attainment (43.6% vs 19.6%), higher income ($69,859 vs $36,376), and lower uninsured rates (7.4% vs 11.5%). DISCUSSION/SIGNIFICANCE OF IMPACT: This work is the first local exploration of community factors and research participation using curated EHR data. Although limited by single-center data and required entry of EHR codes, it is a step into understanding factors that may influence research participation. Local estimates could be improved by utilizing data from all CAPriCORN sites.

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Building capacity through co-design: Developing a community-engaged research 101 training

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OBJECTIVES/GOALS: Community-engaged research (CER) emphasizes equitable partnerships between academic and community partners, yet many lack structured training opportunities to develop the necessary knowledge and skills to engage. Recognizing this gap, we launched a co-design process to develop a CER 101 course tailored for both community members and academics. METHODS/STUDY POPULATION: The CER101 design process is rooted in principles of co-design. CAB members, community partners, and academics meet as part of an iterative, interactive, facilitated process to share perspectives, exchange knowledge, and co-create course content. A 2-day workshop began with a process to align visions – define the audience of the course, identify barriers to engagement with the material, and define parameters of the final product. Activities included structured discussions, brainstorming sessions, and feedback cycles. Emphasis is placed on valuing first-hand experience alongside academic expertise to ensure accessibility and relevance. RESULTS/ANTICIPATED RESULTS: The co-design process will produce a CER 101 training that reflects jointly developed foundational concepts, practical strategies for building equitable community–academic partnerships, and case studies highlighting effective CER practices. Participants are expected to demonstrate improved understanding of CER principles, enhanced ability to apply tools for collaboration, and greater appreciation for both lived and academic expertise. The training will strengthen mutual trust, expand shared capacity for CER, and inform iterative refinements to ensure sustained relevance and impact within the community of practice. DISCUSSION/SIGNIFICANCE OF IMPACT: In addition to resulting in the development of a CER 101 course that includes foundational concepts and practical strategies for engaging in CER, the co-design process will

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lead to increased mutual understanding of CER principles, enhanced appreciation for diverse forms of expertise, and strengthen trust.

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Comparative cardiovascular risk burden across autoimmune diseases: Evidence from a primary care cohort

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OBJECTIVES/GOALS: To generate phenotype-specific insights that support tailored prevention strategies and advance precision cardiovascular risk management within Gulf health systems. METHODS/STUDY POPULATION: We analyzed collected primary care records and retained 14,616 complete cases. A composite CV risk index was constructed using a Framingham-based general CVD algorithm from standard clinical variables. "High risk" was defined as the top cohort quartile. Between-group differences were tested with the Kruskal–Wallis test followed by Dunn's multiple comparisons with Benjamini–Hochberg adjustment. We then modeled (i) the binary high-risk outcome using multivariable logistic regression and (ii) the continuous index using linear regression. Adjusted models included body mass index (BMI), log(ESR + 1), log(CRP + 1), and statin use; variables embedded in the index were not re-adjusted to avoid over-adjustment. RESULTS/ANTICIPATED RESULTS: The proportion above the high-index threshold differed by group: RA 29.4%, no autoimmune 25.7%, multiple-autoimmune 23.9%, SLE 19.8%, and Hashimoto's 12.7%. The Kruskal–Wallis test was significant ($H=68.6$, $df=4$, $p<10-13$), with Dunn tests (BH-adjusted) showing RA > no autoimmune and SLE, and Hashimoto < all groups. In adjusted logistic regression, odds of high index were higher in RA (OR 1.20, 95% CI 1.06–1.37), lower in Hashimoto (OR 0.49, 95% CI 0.40–0.60), and not clearly different in SLE or multiple-autoimmune. Higher BMI (OR/unit 1.08), ESR (OR/log 1.06), and statin use (OR 4.97) were strongly associated. DISCUSSION/SIGNIFICANCE OF IMPACT: In a large primary care cohort, RA showed modestly higher CV risk than non-autoimmune patients after adjustment, while Hashimoto's showed lower burden. Findings support targeted control of risk factors, especially blood pressure, weight, and inflammation in autoimmune populations.

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Pregnancy outcomes following hormonal intrauterine device discontinuation: A prospective cohort study

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OBJECTIVES/GOALS: The objective is to determine the relationship between prior progestin intrauterine device (IUD) use, duration of use, and adverse pregnancy outcomes and also to examine the return-time to fertility and whether demographic factors modify the effect of IUD use on pregnancy outcomes. METHODS/STUDY POPULATION: This is a prospective cohort study of 600 pregnant adults between 10 and 28 weeks of gestation who have not delivered a fetus. We will compare participants with and without prior progestin IUD use. Participants are recruited via flyers posted in university-associated OB-GYN clinics and via the health portal, MyChart. Participants complete a comprehensive contraception, medical, and pregnancy history and receive compensation. Pregnancies are followed until 6 weeks post-delivery, and outcomes are collected via the electronic health record. Pregnancy outcomes will be analyzed using multivariable logistic regression with adjustment for confounders, with sensitivity analyses stratified by duration of prior progestin IUD use. RESULTS/ANTICIPATED RESULTS: We will characterize the prevalence and duration of progestin IUD use in the cohort and evaluate demographic factors associated with IUD use compared to other contraceptive methods. We will compare the rates of placental abnormalities, as well as miscarriage, preterm birth, hypertensive disorders of pregnancy, including preeclampsia and gestational hypertension, and other complications, between participants with prior progestin IUD use versus non-use. Among participants with prior IUD use, we will examine whether the risk of adverse pregnancy outcomes is associated with the length of use. We will also examine the time between the last contraceptive use and conception. DISCUSSION/SIGNIFICANCE OF IMPACT: An association between prior progestin IUD use and pregnancy outcomes would be a novel finding and will have clinical implications for how contraceptive history may inform counseling and reproductive care. We hope that this study will rationalize the need for well-powered, larger studies to investigate the robustness of our study findings.

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Dual roles of β2-adrenergic signaling in the progression of acute myeloid leukemia*

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OBJECTIVES/GOALS: To determine how loss of sympathetic nerves and β2-adrenergic receptor (Adrb2) signaling remodels the leukemic bone marrow niche, alters immune responses against leukemia, and influences acute myeloid leukemia (AML) progression. METHODS/STUDY POPULATION: AML was modeled using MLL-AF9-driven murine leukemia and human AML xenografts (MOLM-13 and patient-derived samples) in NOD scid gamma (NSG) mice. Sympathetic signaling was disrupted chemically with 6-hydroxydopamine or genetically using Adrb2 knockout mice. Leukemic burden,

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