Poster Session A: Thursday, February 27, 2025, at 5:00 PM – 6:30 PM MT

1

Macrophage Migration Inhibitory Factor and Hypoxia-Inducible Factor 1-Alpha May Play a Role in Maintaining Intestinal Homeostasis Through Regulation of Occludin and Claudin-1 Expression.

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Objectives: Axial Spondyloarthritis (axSpA) is a chronic inflammatory condition mainly impacting the musculoskeletal system. The majority of AxSpA patients experience gut inflammation, with 60% having microscopic changes and 10% having overt Inflammatory Bowel Disease (IBD). Over the years, researchers have linked many pathways and cell populations to the pathogenesis of gut inflammation in AxSpA. One notable player may be the macrophage migration inhibitory factor (MIF), a crucial factor in AxSpA development. In a SpA mouse model (SKG mice), MIF overexpression mirrors key clinical features of AxSpA, while inhibiting or depleting MIF attenuates these symptoms. It is believed that MIF and hypoxia-inducible factor 1 alpha (HIF-1α) have a functional interdependence. Nevertheless, the precise role of MIF and HIF in gut inflammation in AxSpA remains uncertain. Here we aimed to investigate the MIF-HIF interaction's impact on gut homeostasis and inflammation in the SKG mouse model.

Methods: Eight weeks old SKG mice were used for this 4 arm study, with 3 mice per arm: SKG control mice, SKG mice treated with curdlan, SKG-MIF Knock Out (KO), and SKG-MIFKO mice treated with curdlan. After 8 weeks of curdlan/ vehicle treatment, 16 weeks old mice were euthanized and formalin-fixed paraffin-embedded (FFPE) blocks of ileum were prepared for immunohistochemistry (IHC). IHC was performed to assess the tight junction markers, occludin and claudin-1 and, HIF-1α expression. Kruskal–Wallis test was used to analyze the difference between the 4 groups.

Results: SKG-MIFKO mice showed reduced occludin and claudin-1 expression, indicating tight junction disruption (Figure 1 A-D). HIF-1α expression decreased significantly in SKG-MIFKO and SKG-MIFKO+curdlan groups. Notably, HIF-1α expression decreased further in SKG-MIFKO+curdlan compared to SKG+curdlan, with a trend of higher expression in SKG+curdlan compared to controls (Figure 1E&F).

Conclusion: Knocking out MIF in SKG mice has resulted in a notable improvement in AxSpA symptoms. However, our findings show that MIF has a protective role in the gut of SKG mice, which is unlike what we see in joints. In the absence of MIF, there was a decrease in the expression of tight junction markers and HIF-1 α, which suggests that the interaction between MIF and HIF is essential for maintaining the integrity of the gut epithelial barrier in the SKG mouse model of SpA. Further investigation is required to determine the role of HIF-1α in transcriptional regulation of tight junction markers.

2

Bimekizumab Maintained Stringent Clinical Responses over 2 Years in Patients with Axial Spondyloarthritis: Results from Two Phase 3 Studies

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Objectives: To assess the maintenance of response to bimekizumab (BKZ) among patients (pts) across the full disease spectrum of axial spondyloarthritis (axSpA) over 2 years in the open-label extension (OLE) of BE MOBILE 1 and 2.

Methods: BE MOBILE 1 (NCT03928704) and 2 (NCT03928743) comprised a 16-week (wk) double-blind period followed by a 36-wk maintenance period in pts with non-radiographic (nr-) and radiographic (r-)axSpA, respectively.1 Pts were randomised to receive subcutaneous BKZ 160 mg every 4 wks (Q4W) or placebo (PBO); from Wk16, all received BKZ. At Wk52, eligible pts could enter BE MOVING (OLE; NCT04436640). Proportions of pts achieving Assessment of SpondyloArthritis international Society ≥40% improvement (ASAS40), ASAS partial remission (PR), ASDAS low disease activity (LDA) and ASDAS inactive disease (ID) to Wk104 were assessed among BKZ-randomised pts who achieved each respective outcome at Wk16, pooled across studies. Presented data use non-responder imputation (NRI), multiple imputation (MI) and worst category imputation (WCI; ASDAS only). Observed case (OC) data are also reported. Treatment-emergent adverse events (TEAEs) to Wk104 are reported for pts who received ≥1 BKZ dose, including pts who switched from PBO to BKZ at Wk16.

Results: Overall, 128 and 221 pts were randomised to BKZ in BE MOBILE 1 and 2, respectively (N=349). High proportions of Wk16 responders maintained their responses at Wk104. [Figure] At Wk16, 160 (45.8%) pts achieved ASAS40; this increased to 180 (51.6%) at Wk104 (NRI). Of Wk16 ASAS40 achievers, 85.7% maintained this response at Wk104 (MI). At Wk16, ASAS PR was achieved by 86 (24.6%) pts; this increased to 100 (28.7%) pts at Wk104 (NRI). Of Wk16 ASAS PR achievers, 76.8% also achieved this outcome at Wk104 (MI). [Figure] ASDAS LDA was achieved by 152 (43.6%) pts at Wk16; this increased to 172 (49.3%) at Wk104 (NRI). Of Wk16 ASDAS LDA achievers, 89.3% also achieved this outcome at Wk104 (MI). ASDAS ID was achieved by 58 (16.6%) pts at Wk16; this increased to 88 (25.2%) at Wk104 (NRI). Of Wk16 ASDAS ID achievers, 76.0% achieved this outcome at Wk104 (MI). [Figure] Through Wk104, 514/574 (89.5%; exposure-adjusted incidence rate per 100 pt-years [EAIR/100 PY]: 141.9) pts on BKZ had ≥1 TEAE; 72 (12.5%; EAIR/100 PY: 5.4) had serious TEAEs. 39 (6.8%; EAIR/100 PY: 2.8) pts discontinued BKZ due to TEAEs.

Conclusion: BKZ maintained stringent clinical responses from Wk16 to Wk104 in axSpA. No new safety signals were observed. Previously submitted to: ACR 2024

3

Clinically Available Biomarkers Associated with Systemic Autoimmune Rheumatic Disease Progression in Anti-Nuclear Antibody Positive Individuals

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Objectives: The presence of Anti-Nuclear Antibodies (ANA) are a hallmark of Systemic Autoimmune Rheumatic Disease (SARD) and can be present years before clinical diagnosis. Although this suggests that ANAs could be used as potential biomarker for disease progression, they are also found in up to 25% of women, only a small fraction of whom (<5%) will develop a SARD. As the onset of symptomatic disease is not infrequently associated with organ damage, there is tremendous interest in identifying biomarkers associated with a high risk of progression, which could potentially enable initiation of preventative therapy. Here, we sought to determine whether any of the tests typically available to Rheumatologists can be used to identify ANA positive individuals at high risk of imminent progression.

Methods: Study participants were recruited from the Early Autoimmune Rheumatic Disease Clinic at Toronto Western Hospital, where ANA positive (≥1:160 by IF or ≥1:80 with a specific autoantibody) individuals without a SARD diagnosis (based upon clinical classification criteria) were followed yearly, or earlier if they had new symptoms, for development of SARD symptoms. Participants either lacked SARD clinical criteria or had insufficient criteria for a SARD diagnosis (UCTD), with progression being defined as the onset of a new clinical criteria for SARD. All ANAs, complements, and specific autoantibodies were measured through the hospital laboratory, with specific ANAs being measured by Bioplex.

Results: 124 ANA positive individuals were followed a minimum of 2 years, 15 of which clinically progressed within 2 years of follow-up. The mean age and proportion of female progressors did not differ significantly from that of non-progressors, however progressors were more likely to be non-Caucasian than non-progressors. Although the ANA titer and serum complement levels were similar in progressors and non-progressors, progressors had significantly more specific ANAs (1.53 ± 1.41 vs 0.88 ± 0.92, $p = 0.019$, Student's t test). With the exception of anti-dsDNA antibodies, all specific ANAs were more prevalent in progressors, but this difference was only significant for anti-La antibodies. The most prevalent antibody in the cohort in both progressors and non-progressors was anti-Ro (46.7% and 35.8%, respectively). Within anti-Ro positive individuals, discrimination between anti-Ro52 and –Ro60 showed that anti-Ro52 but not anti-Ro60 antibodies were significantly associated with progression,

particularly when in tandem with a positive RF (Table 1).
Conclusion: The presence of anti-La and –Ro52 antibodies is associated with an increased risk of imminent clinical progression in the subsequent 2 years and such individuals merit close follow-up.

4

Immune Checkpoint Inhibitors in Patients with Pre-Existing Rheumatic Disease and the Impact of Immunosuppression: Data from the Canadian Research Group of Rheumatology in Immuno-Oncology (CanRIO)

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Objectives: Immune checkpoint inhibitors (ICI) have transformed oncology care, but their use is limited by immune related adverse events (irAEs) and optimal use in patients with rheumatic pre-existing autoimmune disease (Rh-PAD) is unknown [1]. We report on ICI management, baseline immunosuppression, and irAE treatment strategies, using data from the CanRIO retrospective and prospective cohorts from 10 Canadian sites.
Methods: Patients with Rh-PAD recruited to the prospective cohort between Jan 2020 and April 2023 and retrospective cohort from Jan 2013 to June 2022 and who received at least one dose of CTLA-4, PD-1, or PDL-1 ICI therapy were included. Data on irAE treatment, baseline immunosuppression, and cancer outcomes are collected in a REDCap database as per standardized protocol.
Results: Eighty-three eligible patients (40 from prospective and 43 from retrospective cohort) were identified and stratified by baseline immunosuppression (IS), with 44 on baseline IS and 39 not on baseline IS. Baseline IS included corticosteroids, conventional DMARDs, and biologic DMARDs. Of those on baseline IS, 37 had inflammatory arthritis (48.65% active) and 7 had other rheumatic disease (57.14% active). Of those not on baseline IS, 26 had inflammatory arthritis (26.92% active) and 13 had other rheumatic disease (23.08% active). Patients on baseline IS were more likely to have a PAD flare (OR 4.19, P=0.003) and less likely to develop a new unrelated irAE (OR 0.36, P=0.027) compared to those not on baseline IS. In both cohorts, four patients experienced both a flare of their Rh-PAD and a de-novo irAE. Those with de novo irAE generally responded to analgesics, corticosteroids or csDMARDs. There was a non-

significant trend towards patients on baseline IS being more likely to require bDMARD compared to those not on baseline IS (P = 0.057). Grade 1-2 irAEs were more likely to be treated while continuing immunotherapy, while ICIs were either stopped or held in all patients with grade 3-5 events (Baseline IS P = 0.026; No Baseline IS P = 0.052; All Patients P < 0.001). **Conclusion:** Our findings suggest those on baseline IS have higher rates of active PAD at start of ICI therapy. We found 1) Continuing baseline DMARDs may not protect from flares but may prevent de novo irAEs. If de-novo irAEs occur, bDMARD may be required for treatment 2) Continuing immunotherapy during irAE treatment can be considered for patients with low grade irAEs. Future analyses will explore impact of baseline IS on cancer outcomes.

5

Addressing Complications of Complement Activation Product Evaluation in Autoimmune Inflammatory Myopathies

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Objectives: Biomarkers are needed for efficient diagnosis and monitoring of autoimmune inflammatory myopathies (AIM). Complement activation products (CAP) reflect the activation state of the complement system, an important mechanism of AIM pathogenesis. However, CAP analysis requires standardized sampling and accurate assay procedures. This study aimed to establish a standardized protocol for measuring blood-based serum CAPs, C3a, C5a, and soluble C5b-9 (sC5b-9) to be utilized in future research studies evaluating novel biomarkers for AIM.
Methods: Paired plasma (n=21) and serum samples (n=21) from AIM patients, and plasma samples (n=50) from healthy controls (HC), were obtained from the Plasma Services Group (PSG, Moorestown, NJ). Samples were shipped on dry ice, stored at -80°C, and had not undergone any freeze-thaw cycles (non-freeze-thawed [NFT]). Serum samples from AIM patients enrolled in a multi-site Canadian registry were included (n=80) and had undergone 1-3 freeze-thaw (FT) cycles. C3a and C5a concentrations of each sample were measured using meso-scale discovery (Meso Scale Diagnostics, Rockville, MD) while sC5b-9 concentrations were measured with an enzyme-linked immunosorbent assay (Quidel Corporation, San Diego, CA). Using t-tests, for each CAP we compared the mean concentration of 1) plasma to serum (paired patients who had AIM and have not undergone FT), 2) FT to NFT (unpaired AIM patients and these were serum only), and 3) HC to AIM (NFT plasma samples only).
Results: When comparing plasma to serum, serum had higher mean concentrations of C3a (mean difference [MD] 7.7 ng/mL [95% confidence interval [CI]: 2.7, 12.8]) and C5a (MD 98.7 ng/mL [95%CI: 75, 122.3]) (Table 1). There was no significant difference for sC5b-9. When comparing FT to NFT samples, FT samples had significantly higher C3a (MD 3230.6 ng/mL [95%CI: 2919.8, 3541.4]), but lower C5a (MD -96.1 ng/mL [95%CI: -108.6, -83.7]). There was no significant difference for sC5b-9. When comparing AIM to HC, HC had significantly lower sC5b-9 mean concentrations than AIM (MD -8228.8 ng/mL [95%CI: -10379.7, -6077.9]). There

was no difference for C3a between AIM and HC and only a small difference was detected for C5a (MD 3.1 ng/mL [95%CI: 0.5, 5.7]).
Conclusion: Comparing the same type of blood specimen and avoiding freeze-thaw cycles are important factors to consider when interpreting CAP levels, particularly for C3a and C5a. Future studies to examine factors that may have contributed to variability, including differences in AIM patient characteristics such as disease subsets and activity are underway.

6

Anti-Neutrophil Cytoplasmic Antibody(ANCA)-Associated Vasculitis Manifesting Solely as Bilateral Toe Cyanosis: Case Based Review

Jadin Chahade (University of Alberta, Edmonton); Melika Motamedi (University of Alberta, Edmonton); Robert Gniadecki (University of Alberta, Edmonton); Elaine Yacyshyn (Division of Rheumatology, University of Alberta, Edmonton)

A 71-year-old East-Asian female presented with a 2-year history of constant bilateral cyanosis of all toes, not influenced by temperature changes. These symptoms preceded the COVID-19 pandemic. She denied finger involvement, erythromelalgia, or other rashes. There were no signs of ANCA-associated vasculitis. She had tried ASA 81mg without improvement and nifedipine 30mg with mild relief before seeking rheumatological evaluation.

Laboratory investigations were remarkable for positive c-ANCA with a titre PR3 of 735 mean fluorescence units. Other rheumatologic investigations, including antinuclear antibody, extractable nuclear antigens, rheumatoid factor, anti–cyclic citrullinated peptide, anti-double stranded DNA, scleroderma panel, and anti-phospholipid antibodies, were negative. Uveitis/interstitial lung disease were ruled out and general chemistry parameters were normal. She was found to have Type III cryoglobulinemia and hematology was consulted for a full workup of her positive cryoglobulins, which were all unremarkable. There were no signs of connective tissue disease or hepatitis infection.

Azathioprine was started and she was seen in follow-up a year later with a significant decrease in cyanosis of her toes and a decrease in PR3 tire to 3.7.

7

Anti-Trim72 Autoantibodies in Idiopathic Inflammatory Myopathies

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Objectives: The pathogenic mechanisms that underlie the idiopathic inflammatory myopathies (IIM) are complex and not well understood. Triparite motif-containing protein 72 (TRIM72) is expressed in the sarcolemma and mediates membrane-repair following muscle injury [1].

Autoantibodies directed against TRIM72 (anti-TRIM72) have been identified in IIM patients [2]. Anti-TRIM72 autoantibodies may contribute to disease pathogenesis by disrupting the endogenous repair functions of TRIM72 [2]. The aim of this study was to investigate the anti-TRIM72 expression and associated clinical characteristics in IIM patients.
Methods: Sera from patients meeting a clinical diagnosis of IIM patients (dermatomyositis [DM], antisynthetase syndrome [ASyS], immune mediated necrotizing myopathy [IMNM]) and healthy controls (HC) were included. Anti-TRIM72 autoantibodies were tested using enzyme linked immunosorbent assay. Anti-TRIM72 testing was positive if normalized value was >2 standard deviations above the mean for healthy controls. Maximum CK and lowest recorded DLCO were identified through retrospective chart review. One-way ANOVA and student's T test were used to compare groups.
Results: There were 523 IIM patients (ASyS, n=200; IMNM, n=198; DM, n=125) and 67 HC included. Mean anti-TRIM72 levels were significantly increased in patients with ASyS and IMNM when compared to patients with DM and healthy controls (one-way ANOVA, $p<0.0001$, Figure 1a). There were 82 ASyS patients had available clinical data and 17.1% (n=14) were anti-TRIM72 positive. When CK values were assessed in patients with ASyS, there was no significant difference between anti-TRIM72 positive patients when compared to those who were negative (difference 1027U/L, 95%CI -1711 to 3765, Figure 1B). When mean diffusion capacities (lowest DLCO %) were compared between anti-TRIM72 positive and negative ASyS patients, there was no significant difference between groups (difference 5.0%, 95%CI -9.5 to 19.5, Figure 1C). In patients with IMNM, 14.0% were anti-TRIM72 positive (13/93). There was no significant difference in peak CK when anti-TRIM72 positive and negative IMNM patients (difference -913.9, 95%CI -6097 to 4270, Figure 1D).
Conclusion: Anti-TRIM72 autoantibodies are expressed in a subset of patients with both ASyS and IMNM. Previous studies have suggested a pathogenic role in IIM; however, further studies are needed to understand the clinical manifestations and utility of these autoantibodies.

8

Rotavirus Vaccine in Offspring Exposed in Utero to Tumour Necrosis Factor Inhibitors Was Not Associated with an Increased Risk of Diarrhea Events During the First 6 Months of Life

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Objectives: Guidelines previously recommended withholding the rotavirus vaccine among in utero TNFi-exposed infants until 6 months due to infection risk in immunosuppressed infants.[1] However, delaying vaccination may increase diarrhea-associated morbidity compared to routine immunization starting at 2 months. We compared the risk of diarrhea-associated healthcare

events (“diarrhea events”) during the first 6 months among in utero TNFi-exposed and -unexposed infants based on vaccination status.
Methods: We created a cohort of offspring born to mothers with chronic inflammatory diseases (MarketScan; 2011-2021) and identified those exposed to ≥1 TNFi prescription in utero and those not. Infants born in the 13 US states with a state-funded universal rotavirus vaccine program were excluded due to the absence of private insurer claims. Time-varying vaccine status was identified by ≥1 billing code for RV1 or RV5 vaccines administered between 2 and 6 months. Follow-up began at 2 months and ended at 6 months. Diarrhea events were defined by relevant ICD-9/10 codes for hospitalizations or outpatient visits. We estimated the association of the vaccine with diarrhea risks among TNFi-exposed and -unexposed offspring using Cox proportional hazards models, as well as among infants exposed to TNFi in the third trimester and those exposed in the first and second trimesters. Models were adjusted for in utero drug exposure (non-biologic immunomodulators, corticosteroids), preterm birth, sex, geographic region, year and season of birth, and TNFi placental transfer.
Results: We identified 49,585 offspring; 3,167 were TNFi-exposed in utero; 83% received at least one dose of the rotavirus vaccine between 2-6 months (Figure 1A). Among TNFi-unexposed offspring, the vaccine was associated with a 32% increase in diarrhea events (hazard ratio, HR, 1.32; 95% confidence interval, CI, 1.13, 1.54)(Figure 1B). However, among TNFi-exposed offspring, no statistically significant association was found between the vaccine and diarrhea event risk (HR 1.07; 95% CI 0.72, 1.61), including in those TNFi-exposed during the third trimester (HR 1.13; 95% CI 0.68, 1.86), or only during the first and/or second trimesters (HR 0.89; 95% CI 0.45, 1.76). When looking at the vaccine’s effect among those exposed to high placental-transfer TNFi in the third trimester, no statistically significant association was found (HR 0.97; 95% CI 0.57, 1.66).
Conclusion: Our findings suggest no increased risk of diarrhea events related to rotavirus vaccination during the first 6 months of life among in utero TNFi-exposed offspring, even for late TNFi exposure during pregnancy. These results support the updated recommendation not to delay rotavirus vaccination in TNFi-exposed infants.[2]

9

Development of Mogad in a Patient with Granulomatosis with Polyangiitis and Giant Cell Arteritis Overlap Syndrome

Inioluwa Adeboye (University of Calgary, Calgary); Anjolaoluwa Antonio (University of Calgary, Calgary); Stephen Williams (Cumming School of Medicine, Calgary); Aurore Fifi-Mah (University of Calgary, Calgary)

A 77-year-old male with GCA with PMR and GPA (both in remission) presented in May 2024 with new-onset left eye pain with reduced vision and visual white out immediately following scheduled cataract surgery. He was seen by ophthalmology who suspected optic neuritis with MRI showing enhancement of the left optic nerve. CTA head was normal. He was initiated on methylprednisolone 1g IV for 3 days and his vision recovered to baseline by day 3 of therapy. He was continued on a course of prednisone 30mg po qd. Due to the atypical nature of his presentation, MOG and NMO antibodies were sent. MOG antibody returned as highly positive which suggested MOGAD After Rheumatology review, there was no evidence of vasculitis flare. He was continued on prednisone without relapse with a gradual taper over 3 months.

10

Compounding for Rheumatologists: A Glimpse Inside the Black Box of Pricing to Patients

Inioluwa Adeboye (University of Calgary, Calgary); Stephen Williams (Cumming School of Medicine, Calgary); Aurore Fifi-Mah (University of Calgary, Calgary)

Objectives: Drug compounding is the combining, mixing, or alteration of active pharmaceutical ingredients (API) into doses or dosage forms for individual patients. While often prescribed by rheumatologists, the methodology behind drug compound pricing by pharmacies remains unclear to most rheumatologists. In this study, we reviewed the approach to pricing one of the most prescribed compounds: 100 grams of diclofenac 10% in PLO.

Methods: The constituent costs of a drug compound were determined by interviewing members of the Alberta Pharmacist's Association. API and excipient ingredient costs were determined by reviewing listed wholesaler prices. Published insurance plan information was used for dispensing fees and insurer permitted mark-ups.[1] These mark-ups are at the pharmacy's discretion if a patient pays cash. Price quotes were attained by calling pharmacies across Alberta. Independent, chain, and compounding pharmacies were called to ensure representation from the different pharmacy types. Only one pharmacy from each brand/banner was called.

Results: A comprehensive overview of price constituents for diclofenac 10% in PLO is seen in Figure 1. Using the information available, we determined the theoretical lowest cost for this compound was $31.78. Contextually, the cost per 10g of diclofenac (amount needed to make compound) ranged from $2.92-$17.92 The cost per 90g of PLO (amount needed to make compound) ranged from $8.67-$13.86. Mark-up and dispensing was the largest contributor to final price.The real price varied considerably by pharmacy. The average price for 100g of 10% diclofenac was $50.54 (range: 38.42-55.82) at chains, $88.36 (range: 37.83-205.00) at compounding pharmacies, and $94.63 (range: 55.75-170.00) at independent pharmacies.

Conclusion: A wide range of prices for the same compound were determined. Several factors contribute to the large price variations. They most important be summarized as follows: 1. Differing acquisition costs from wholesalers for the active pharmaceutical ingredient and excipients (diclofenac, PLO), 2. Mark-ups, which can be changed at the pharmacy's discretion for patients without insurance 3. Dispensing fees 4. Hidden repackaging costs (charges associated with a non-compounding pharmacy acquiring compounds from another pharmacy) It is important to note that items 1-3 provide profit to the pharmacy after covering labour and material costs. These findings have important implications for prescribing rheumatologists and patients without adequate insurance who may be exposed to elevated prices without their knowledge. A range of price from $33.55 to $205.00 a product costing $31.78 to make highlights the need for greater price transparency. Rheumatologists are well-situated as prescribers to advocate on behalf of patients.

11

Rheumatology Diagnostics Utilizing Artificial Intelligence for Ana Pattern Identification and Titre Quantification

Farbod Moghaddam (University of Calgary, Calgary); Mohammad Sajadi (University of Calgary, Calgary); Ann Clarke (University of Calgary, Calgary); Sasha Bernatsky (McGill

University Health Centre, Department of Medicine, Division of Rheumatology, Division of Clinical Epidemiology, Montreal); Irene Chen (UC Berkeley, San Francisco); Karen Costenbader (Brigham and Women's Hospital, Boston); Marvin Fritzler (University of Calgary, Calgary); Mina Aminghafari (University of Calgary, Calgary); May Choi (University of Calgary, Calgary); SLICC The Systemic Lupus Erythematosus International Collaborating Clinics (N/A)

Objectives: Antinuclear antibody (ANA) immunofluorescence (IFA) patterns and titres are a key part of rheumatology diagnostics, however, there is considerable intra- and inter-laboratory variability with manual interpretation. Replacing manual interpretation with a standardized and automated approach could help reduce variability, increasing laboratory accuracy and efficiency. We developed and compared eight different machine learning (ML) models to aid laboratories in ANA pattern and titre interpretation.

Methods: 13,671 ANA images from SLE patients enrolled in the Systemic Lupus International Collaborating Clinics Inception Cohort (SLICC, n=2,825 images), non-SLE subjects enrolled in the Ontario Health Study (OHS, n=10,639 images), and the International Consensus on ANA Patterns (ICAP, n=207 images) were analyzed. All SLICC and OHS ANA were performed in one central laboratory using IFA on HEp-2 cells (NovaLite, Werfen, SD) and read on a digital IFA microscope (NovaView, Werfen, SD). One laboratory technologist (HH) with >30 years of experience in ANA studies interpreted 13 ANA patterns and titre for each image. We developed and compared the performance of eight ML models for ANA pattern recognition. To evaluate ANA titre, we used ML to identify individual HEp-2 cells in the ANA images and then calculated cell illuminance and cut-offs corresponding to each titre (1:80-1:5120). Fifty images were randomly selected to compare the titre classification based on image processing with the lab technologist as the reference standard.

Results: 6,307 images containing at least one ANA pattern (>=1:80) from SLICC (n=2806 images), OHS (n=3339 images), and ICAP (n=162 images) were included. We identified one ML model (ANA Reader©) with the best performance for ANA pattern identification compared to the reference with a high area under the curve (AUC) score of 83.4%, modest weighted accuracy of 68.4%, precision of 67.1%, sensitivity of 70.1%, and F1 score of 67.2%. The AUC for individual ANA patterns ranged from 0.71 to 0.97 (Figure 1). There was a strong correlation between titres reported by the ANA Reader© and the technologist's interpretation (Spearman rank 0.93, p <0.0001), where the titres reported were identical or differed by only one dilution in most cases (96.0%).

Conclusion: ML has the potential to become a highly effective and efficient approach to evaluating ANA patterns and titres. The performance of our ANA Reader© is expected to improve as we continue to train our models with more ANA images. Future external validation studies and the development of other ML models to predict more complex and multiple ANA patterns and titres are also underway.

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Analysis of the Implications of Lumbopelvic Alignment on the Alignment of the Cervical Spine

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Objectives: To date, standard patterns of alignment in the cervical spine have not been conclusively defined. Previous studies have attempted to establish these patterns however, the results were inconsistent and limited by a small sample size. Knowledge of normal alignment is essential in evaluation and preoperative planning for deformity correction. This study aims to establish normative value groups for the alignment of the cervical spine.
Methods: Healthy volunteers (N = 441) between 20-40 years of age with no pre-existing spine pathology were recruited. Whole-body 2D EOS imaging was obtained for all participants. Using a semi-automated image segmentation software (KEOPS, by SMAIO), standard measures of alignment of the pelvis, lumbar, thoracic, and cervical spine were obtained. Coordinates of the cervical vertebral bodies, T1 and T2, were normalized on the centroid of T2 and input into a k-means algorithm to identify optimal clusters. A feature selection algorithm (recursive feature elimination) determined the best differentiating coordinates. Several machine learning models were trained, via a 5-fold cross validation, on the coordinates selected by the feature selection algorithm to predict labels defined by the k-means algorithm.
Results: The average age of participants was 28.2±5.1 years. Fifty-five percent of participants were female; the average BMI was 24.7±4.3 kg/m2. Three clusters were identified (n=176, 140, 125), best differentiated by C5 and C6 coordinates, with the mean coordinate points of each cluster displayed in figure 1. The machine learning model with the highest accuracy was neural network, with accuracy = 94.4%, precision = 95.0%, recall = 94.4%, and f1 score = 94.4%.
Conclusion: Three new clusters were identified based on alignment of the cervical spine, with the normative value for each cluster being the mean of each coordinate. Future directions include validating these clusters using an external dataset and examining the link between these clusters and alignment of the thoracolumbar spine and pelvis.

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Increased Cardiovascular Events in Paget's Disease of Bone, a Study from the Cartagene Cohort

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Objectives: Paget's disease of bone is a focal late-onset chronic disorder of bone remodelling, characterized by bone resorption followed by compensatory bone formation. This disease is most often asymptomatic, but an increase in cardiovascular events has been observed over time in this population. We aimed to evaluate the association between Paget's disease and the risk of cardiovascular events (CVE) within the CARTaGENE cohort. We also determined the association between arterial stiffness parameters and the risk of CVE, and the association between Paget's disease and arterial stiffness.
Methods: We used data collected from the CARTaGENE cohort, a population cohort including nearly 20,000 men and women aged between 40 and 69 years, recruited in 2009/2010 in the province of Quebec, and followed for 10 years, for the study of chronic diseases. We evaluated the risk of CVE (i.e. myocardial infarction, stroke, coronary heart disease, coronary

revascularization, heart failure, peripheral arterial disease, cardiovascular mortality) during follow-up associated with Paget's disease with Cox proportional hazard models and Kaplan-Meier survival curves. All estimates were adjusted for sex, diabetes, hypertension, and smoking. We evaluated the association between Paget's disease and arterial stiffness, measured by central augmentation index, with linear regression models. Lastly, in pagetic participants, we evaluated the association between arterial stiffness and the risk of CVE at follow-up with Cox regression. A p value <0.05 was considered significant. These analyzes were carried out by SAS 9.4.
Results: Among 19 990 participants, we identified 101 (0.5%) patients with Paget's disease (mean age 48 ± 8 years, 46% of women), diagnosed from 1991 to 2021. Paget's disease was associated with an increased risk of CVE during follow-up [95% confidence interval (CI) HR 1.48 (1,05-2,09) p<0.0028] (Figure 1). No significant association was found between arterial stiffness in Paget's disease and a cardiovascular event [95% confidence interval (CI) HR 2.90 (0.007- 1275.92)]. Lastly, no association was found between Paget's disease and arterial stiffness (R^2= 0.22, β= 0.0034, p = 0.75).
Conclusion: Paget's disease is associated with an increased risk of CVE. However, arterial stiffness, as measured by the central augmentation index, is not associated with this increased risk and Paget's disease is not associated with arterial stiffness in our cohort.

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Anti-Spike Antibodies Protect Against Covid-19 Infection in Immune-Mediated Inflammatory Diseases: Findings from the Succeed Study

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Objectives: People with immune-mediated inflammatory diseases (IMIDs) may be more vulnerable to severe COVID-19 outcomes. COVID-19 vaccination is a key element in mitigating this risk. Anti-SARS-CoV-2 antibodies (Ab), including anti-spike (S) and anti-receptor binding domain (RBD) Ab, are metrics of seroconversion following COVID-19 vaccination in the general population. We assessed if anti-S and anti-RBD antibodies were negatively correlated with COVID-19 infection in IMID.
Methods: SUCCEED, a prospective Canada-wide study, was conducted in two phases. First, between Feb 2021 - Jul 2023, adult IMID participants provided dried blood spot samples for anti-S and anti-RBD ELISA testing at intervals of 1, 3, 6, and 12 months following each COVID-19 vaccine dose. Second, between Sep 2022 - Aug 2023, consenting participants from 4

academic centers in British Columbia, Ontario and Quebec (2) also provided monthly saliva samples for PCR detection of SARS-CoV-2. We studied subjects receiving at least their primary series (3+ doses) of a COVID-19 vaccine. Multivariable general estimating equation (GEE) models (accounting for repeated measures) evaluated PCR SARS-CoV-2 detection in saliva, assessing the effects of anti-S or anti-RBD levels (in separate models) within the 6 months preceding a given saliva sample. We controlled for recent COVID-19 infection, sex, age, medications (conventional immunosuppressives, biologics, and prednisone), and time since last COVID vaccine.
Results: 366 participants contributed 1,266 saliva samples. Participants were 79.8% female and 85.5% White, with median age 56.7 (standard deviation: 13.8) years. Most participants were taking immunosuppressants (N=252, 68.9%). The majority (N=356, 97.3%) of participants displayed seroconversion at the first saliva sample, defined as ≥11.3 Binding Antibody Units (BAU)/ml for anti-S or ≥31 BAU/ml for anti-RBD. In the GEE models of positive saliva PCR for SARS-CoV-2 (see Table 1), a 1000 BAU/ml increase in anti-S was associated with an adjusted odds ratio (aOR) of 0.66 (95% confidence interval [CI] 0.45-0.97). Anti-RBD Ab levels had a similar effect (aOR 0.91, 95% CI 0.81-1.02).
Conclusion: In this large, multi-centre sample of COVID-19-vaccinated individuals with IMIDs, most of whom were immunosuppressed, we demonstrated that anti-S Ab levels were associated with lower odds of positive saliva PCR test for SARS-CoV-2, with a similar trend for anti-RBD Ab. This highlights clear benefits for vaccination against SARS-CoV-2 in IMID.

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Work Outcomes and Predictors of Early Work Cessation in Individuals Living with Systemic Lupus Erythematosus: Insights from the Canadian Canios Cohort

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Objectives: Early work cessation is a significant contributor to the personal and societal costs associated with systemic lupus erythematosus (SLE). We sought to describe work status in people with diagnosed SLE and to identify factors associated with early work cessation.
Methods: We used data from the multicentre Canadian Network for Improved Outcomes in Systemic lupus erythematosus cohort (CaNIOS). Lupus symptoms were assessed using the self-reported SLE activity questionnaire (SLAQ). Helaht related quality of life which reflects healht status was assessed using the Short-Form 36 physical and mental component scores (PCS and MCS respectively). Work status [working at least 10 hours per wk, hours worked/wk (categorized as 1-15, 16-30, >30 hrs), retired, full-time student, disabled, full-time homemaker] was reported annually. We evaluated work status at baseline and during follow-up in participants of working age (defined as <66, the average retirement age in Canada). We defined incident SLE as having the baseline study visit within 12 months of diagnosis. Binary logistic regression analysis was used to identify variables associated with baseline work status. Models included gender, duration of lupus, achievement of high school education, SLAC, PCS and MCS.
Results: Work status was available for 2194 working age participants (90.6% women, mean age

43 (12.7) years, 1910/2170 (88%) completed high school, 693/1245(56%) had insurance for disability, 1040/1350 (77%) for prescription drugs, and 811/1267(64% for physiotherapy). At the baseline visit, for prevalent cases, 1158/(52.8%) were working, 214(9.8%) were retired, 225 (10.3%) were full-time homemakers, 145(6.6%) were full-time students and 363 (16.5%) were disabled. Of working age participants 269 had incident SLE. For the 269 incident SLE paticipants of working at the baseline visit 157 (58.4%) were working, 19 (7.1%) were retired, 27(10.1%) were full-time homemakers, 21 (7.8%) were full-time students and 33 (12.3%) were disabled. Work status was stable during follow-up as were overall hours worked (Figure). In the subset of participants with available data (N=407), high school completers (OR 3.0 (1.61,5.65), higher (better) PCS (1.07 (1.04, 1.09) and MCS (1.03 (1.01, 1.05), and higher SLAQ 1.045(1.01, 1.08) were associated with working at baseline; gender (OR 1.5(0.72,3.32) and disease duration OR 0.99(0.97, 1.01) were not.

Conclusion: Patients with SLE are employed at lower rates than the general Canadian population. Employment appears to be influenced by both demographic factors such as education and both physical and mental health status. Strategies to imporve employment rates for people with SLE are needed.

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Clinical Significance of Magnetic Resonance Enterography Detected Sacroiliitis in Pediatric Crohn's Disease: a Retrospective Cohort Study

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Objectives: The musculoskeletal (MSK) system is the most frequent extraintestinal manifestation (EIM) in Crohn's disease (CD) [1]. One pediatric study has reported on asymptomatic sacroiliitis (SI) in pediatric inflammatory bowel disease (pIBD), detecting this in 15% (5/34) [2]. MSK EIMs can have a serious impact on patients' quality of life and is associated with increased severity of bowel disease activity in pIBD [3]. Given the paucity of literature on this topic, we aim to describe the prevalence of asymptomatic SI and its relationship to clinical characteristics, bowel disease phenotype, intestinal disease activity scores, biomarkers, and other EIMs of disease.

Methods: In this single-centre, retrospective cohort study, data were collected from newly diagnosed (<1 year) pediatric CD patients who had undergone magnetic resonance enterography (MRE) at Children's Hospital, London Health Sciences Centre over four years (2019 – 2023). Subjects were excluded if the sacroiliac joints were unable to be adequately assessed by the radiologist or if the patient had a previously known diagnosis of spondyloarthritis. Coronal T1, axial T2, and coronal T2W sequences with fat suppression of the MREs were evaluated by an MSK-trained radiologist, with a secondary read by a pediatric-trained MSK radiologist (25% of the cases) to establish inter-rater reliability. Descriptive statistics were used to describe baseline characteristics and group comparisons.

Results: Among 135 patients with CD who underwent MRE, 10 patients (7.4%) showed evidence of SI on MRE. Patients were sub-categorized as acute SI (2.2%), chronic SI (3%), and acute on chronic SI (2.2%). [Table 1] Half of the patients with evidence of SI on MRE had evidence of inflammatory MSK manifestations. Patients with SI had higher frequency of arthralgia (p-value 0.033), joint swelling (p-value 0.039), and enthesitis (p-value 0.019). There were no significant differences in symptoms of back pain, neither mechanical nor inflammatory. Patients with SI did have significantly higher Simple Endoscopic Scores-CD at initial scope assessment compared to those without (p-value 0.006).
Conclusion: Among newly diagnosed pediatric CD patients who underwent MRE examination, 7.4% were identified to have SI. Patients with CD and SI were more likely to report other MSK symptoms and had higher CD endoscopic scores. Limitations of this study include the lack of systematic rheumatology assessment of CD patients for MSK signs/symptoms. Further analyses are planned to evaluate the bowel disease outcomes in patients with SI over time.

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Access to Healthy Food and Clinical Status at the Time of Juvenile Idiopathic Arthritis (JIA) Diagnosis

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Objectives: Lifestyle factors such as diet and physical activity may impact JIA disease activity and outcomes (1). There is a suspicion that poor access to healthy food may contribute to worse JIA outcomes (2, 3). Recent research has highlighted significant disparities in food environments and accessibility to healthy food across Canada. Therefore, this study aims to explore the potential ecological relationship of poor food accessibility with clinical and growth parameters in Canadian children with JIA.
Methods: Data on newly diagnosed children with JIA over a 4-year period (2017-2021) from the Canadian Alliance of Pediatric Rheumatology Investigator (CAPRI) JIA Registry were examined for clinical measures and growth parameters at enrollment (<3m after diagnosis). Data were linked to neighbourhood-level food accessibility derived from the Canadian Food Environment Dataset using household postal codes. Association between food accessibility measures and clinical and growth parameters were examined with Spearman's rho correlation tests. Clinical parameters included active joint count, parent global assessment (Parent GA), childhood health assessment questionnaire (CHAQ), self-reported pain, physician global assessment of disease activity (PGADA), clinical Juvenile Arthritis Disease Activity Score (cJADAS), Quality of my life (QoML), and the Juvenile Arthritis Quality of Life Questionnaire (JAQQ)
Results: Among 641 JIA patients, 150 (25.2%) were overweight or obese (>85%ile). Children with poorer accessibility to fresh and nutritious retail food in their neighborhood were found to have higher body weight ($r_s = -0.086$, $p = 0.040$). Surprisingly at baseline, living in neighbourhoods with increase densities of fast-food stores and convenience stores was not

associated with higher measures of disease activity. Higher proportion of fast-food restaurants was associated with lower active joint counts (rs = -0.088, p = 0.035), and a trend towards lower PGADA (rs = -0.078, p = 0.063) and cJADAS (rs = -0.083, p = 0.052). No significant associations were found between reduced access to healthy food and PGADA, cJADAS, JAQQ, pain, Parent GA or CHAQ scores at baseline (Table 1).
Conclusion: These preliminary results suggest that poor accessibility to healthy food was associated with higher weight at presentation of JIA. Overall, increased access to both healthy and unhealthy food is associated with lower disease activity. We speculate this association may be related to other benefits of urbanicity. Further analyses using linear mixed models will examine the relationship between food accessibility and changes in disease activity and weight over the first year of disease.

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Janus Kinase Inhibitor Exposure During Pregnancy in Immune-Mediated Inflammatory Diseases: A Case Series of 3 Patients

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Between Jan 2021 - Oct 2024, patients who had been exposed to JAKi and assessed in the pregnancy and rheumatic diseases clinic were identified. We extracted information on maternal characteristics and pregnancy outcomes.

We identified 6 patients with JAKi exposure. Three patients were on JAKi at the time of pre-pregnancy consultation, but were advised to discontinue treatment in anticipation of pregnancy and switch to alternate therapy. Three patients had unexpected pregnancies while on JAKi for treatment of inflammatory arthritis. Of these, Patient 1 and Patient 2 had 16 and 13 days of post-conception exposure to upadacitinib respectively. Patient 3 had 30 days of post-conception tofacitinib exposure. All patients immediately discontinued their use of JAKi once pregnancy was confirmed.

Table 1 summarizes pregnancy outcomes. Patients 1 and 2 experienced normal pregnancies, delivering via elective cesarean section at term without complications. Patient 3 required emergency c-section at 39 weeks due to breech presentation. No birth defects were observed in any of the infants. All had normal birth weights. Infant 3 required a brief admission to neonatal intensive care for observation, but was discharged without any complications. Patient 1 was in drug free remission during pregnancy but restarted her JAKi at 3 months postpartum after she stopped breastfeeding. Patient 2 developed a flare in pregnancy after discontinuing therapy and was started on a TNF inhibitor with excellent response. Patient 3 was treated with hydroxychloroquine monotherapy in pregnancy and responded well.

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A Retrospective Descriptive Analysis of a British Columbian Myositis Cohort

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Objectives: To describe clinical phenotypes of inflammatory myopathies (IIM), serologies, treatment regimens, remission status, and survival outcomes, in a single centre in BC.

Methods: This is retrospective chart review of all IIM patients seen from March 2019 until June 2024 at Mary Pack Artheritis Centre myositis clinic. We reviewed patient demographics, myositis antibodies, treatments, and clinical course. This study was approved by the University Research Ethics Board.

Results: A total of 268 patients were included with mean follow-up of 69.6 months. The patient baseline demographics and clinical characteristics at the last follow-up are summarized in Table 1. Anti-synthetase syndrome, dermatomyositis, immune mediated necrotizing myopathy, and scleromyositis constituted most of the cohort. Polymyositis made up only 6.7% of the patients. Seventeen patients (6.3%) had a cancer diagnosis within 3 years of their myositis diagnosis. Prevalence of myositis specific antibody (MSA) and myositis associated antibody (MAA) was 83.2%. Anti-Jo-1 was the most common MSA at 14.2%. Anti-Ro52 was the most common MAA at 28.0%. For treatment, patients on average were trialed on 2-3 conventional synthetic disease modifying anti-rheumatic drugs (csDMARDs). 31.7% were on biologics/targeted synthetic (ts) DMARDs at the last follow-up or at the time of death, including 16.4% on Rituximab, 10.1% on Tofacitinib, 4.5% on Upadacitinib and 0.8% on both Rituximab and Tofacitinib. Additionally, 40% of the cohort have used IVIG at one point. Overall, 64% of patients were in remission, 24% had active disease, 11% deceased, and 1% lost to follow-up. Causes of death included infections, cancer, heart failure, pulmonary emboli, and rapid progressive interstitial lung disease refractory to immunosuppression.

Conclusion: This study summarizes the diverse clinical characteristics and treatment paradigms in the largest myositis cohort in BC. Consistent with the literature, polymyositis is a diagnosis of exclusion and only 6.7% of patients received a diagnosis of polymyositis. Despite immunosuppressives and IVIG, mortality was high at 11% in this cohort and remission rate was only achieved in 64%, underscoring the importance of personalized management approaches in improving early diagnosis, remission rates and survival in myositis patients.

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Psoriasis/Psoriatic Arthritis Patients do not Have an Increased Risk of Venous Thromboembolism: A General Population-Based Study

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Objectives: The increased risk of venous thromboembolism (VTE) has been reported in several autoimmune rheumatic diseases (1). A few studies on the risk of VTE among patients with psoriatic disease (PsO or PsA) have been reported (2), however, they are limited due to the use of a prevalent cohort which may be prone to survival bias, the use of selected samples from hospitals (2), and the lack of adjustment for medications (2), especially medications that are known risk factors for VTE like contraceptives (3). Objectives: 1) To estimate the overall risk of venous thromboembolism (VTE) including pulmonary embolism (PE) and deep vein thrombosis (DVT) in a population-based incident psoriasis (PsO) / psoriatic arthritis (PsA) cohort from an entire province of Canada; 2) to estimate the trend of risks of VTE, PE, and DVT after PsO/PsA diagnosis up to five years comparing with the general population.
Methods: Using a population-based administrative database that includes all residents of British Columbia, Canada, we created a large cohort of all patients with incident PsO/PsA and matched them with non-PsO/PsA (1:1). We compared incidence rates (IRs) of VTE, PE, and DVT between the two groups and calculated hazard ratios (HRs) according to follow-up period, adjusting for potential VTE risk factors and confounders.
Results: Among 142,315 incident PsO/PsA patients (51.7% female, mean age 51), the IRs of VTE, PE, and DVT were 2.29, 0.94, and 1.81 cases per 1,000 person-years in the PsO/PsA cohort, respectively, comparing with 1.94, 0.83, and 1.53 cases per 1,000 person-years in the non-PsO/PsA cohort. Compared with the non-PsO/PsA cohort, multivariable HRs for VTE, PE, and DVT among the PsO/PsA cohort were 1.08 (1.04-1.11), 1.06 (1.00-1.12), and 1.07 (1.03-1.12).
Conclusion: Unlike most inflammatory diseases, patients with psoriatic disease do not have an increased risk of VTE, PE and DVT compared to individuals from the general population.

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Certolizumab Inhibits Radiographic Progression Even in Rheumatoid Arthritis Patients with High Rheumatoid Factor Levels: a Pooled, Post-Hoc Analysis of Two Phase 3 Trials

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Objectives: To assess radiographic progression in certolizumab pegol (CZP)+methotrexate (MTX) vs placebo (PBO)+MTX-treated patients (pts) with rheumatoid arthritis (RA), stratified by rheumatoid factor (RF) level, in the C-EARLY (NCT01519791) and C-OPERA (NCT01451203) phase 3 randomised trials.

Methods: A pooled analysis of pts with early (≤1 year active disease) moderate-to-severe RA with poor prognostic factors in the C-EARLY and C-OPERA trials is presented (full analysis set). At Week (Wk)24, PBO-treated non-responders could switch to CZP for the remaining 28 wks (early escapers). Pts were stratified by baseline (BL) RF level (low: <200 IU/mL; high: ≥200 IU/mL), per published strata.1,2 Change from BL in modified total Sharp score (mTSS) and proportions of pts experiencing minimum clinically important difference (worsening) of mTSS (>5) at Wk24 and Wk52 are reported.

Results: 813 CZP-treated (low RF: N=571; high RF: N=242) and 367 PBO-treated (low RF: N=242; high RF: N=125) pts with BL RF measurements were included; 56 PBO-treated pts were early escapers. BL characteristics were similar between CZP- and PBO-treated pts within each RF stratification. However, pts with high RF had more severe disease at BL than those with low RF, with higher mean C-reactive protein, anti-citrullinated protein antibodies, mTSS, and erosion scores. By Wk52, mean mTSS increased from BL in PBO-treated pts with both high RF (change from BL [CfB]: 2.36±6.20) and low RF (CfB: 1.37±3.43), but was comparable in CZP-treated pts (high RF, CfB: 0.28±2.63; low RF, CfB: 0.14±3.11). The proportion of pts with meaningfully worsening radiographic progression was higher in PBO-treated pts with high RF compared to low RF at both Wk24 (6.48% vs 2.84%) and Wk52 (17.59% vs 10.43%). [Figure] By contrast, a smaller proportion of CZP-treated pts experienced meaningful worsening and this was similar between pts with high and low RF (Wk24: 0.00% vs 1.05%; Wk52: 5.29% vs 3.14%, respectively).

Conclusion: Pts with high BL RF levels had more severe RA and BL radiographic damage than those with low RF. Worsening radiographic damage was observed in PBO-treated pts, with slightly greater progression in high-RF pts than low-RF. In contrast, irrespective of BL RF levels, CZP-treated pts demonstrated consistently lower radiographic progression, suggesting RF does not adversely influence radiographic response to CZP. Previously submitted to: ACR 2024

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Catching on to Catch (Canadian Early Arthritis Cohort) Rheumatoid Arthritis Research: Translating 15 Years of Knowledge for Clinicians

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Objectives: Since it's inception in 2007, the Canadian Early Arthritis Cohort (CATCH) has produced hundreds of research outputs on rheumatoid arthritis (RA) pathogenesis, prognosis, comparative effectiveness, safety, quality improvement, patient and physician outcome measures, and comorbidities. Dissemination of knowledge from observational cohort studies is a critical step in the knowledge to action cycle but is often overlooked outside of formal academic publications and presentations.
Methods: We developed a multi-modal targeted knowledge translation (KT) plan for clinicians focused on key learnings over the past 15 years. We first synthesized over fifteen years of CATCH data into fifteen actionable insights, each accompanied by a concise summary. Short videos were created for each learning, featuring members of the Scientific Advisory Committee and facilitated by an individual living with RA. These videos focused on described the learning and practical ways to implement the insights into clinical practice with an emphasis on improving patient care. An infographic was also developed to complement the video series. Both the videos and the infographic were uploaded to YouTube and the CATCH website (www.earlyarthritis.ca) and shared on social media platforms, like X and Instagram under the handle @earlyarthritis. We refined the communications strategy by adjusting interview questions and updating keywords to better suit a clinician audience. All website content and some social media and video content were made available in French.
Results: The top 15 learnings from CATCH are summarized in Table 1. Over twenty videos were filmed about the "Top 15 CATCH Learnings" series and will be released shortly on the CATCH YouTube channel (@canadianearlyarthritiscoho928). All videos are available in English, while five are available in French to meet the educational needs of francophone clinicians (2). The effectiveness of the KT strategy will be assessed using engagement metrics (e.g. YouTube video views) and content reception measured via a survey. To date, the YouTube channel hosts over 140 videos available for patients and clinicians in English and French, with nearly 115,000 total views.
Conclusion: Implementing KT strategies is essential for bridging the evidence-to-practice gap in RA care. Our clinician-focused KT strategy supports professional development and informs clinical practice. Future efforts will concentrate on assessing the effectiveness and impact of this KT strategy on clinician behavior, clinical practice, and patient outcomes.

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Clinical Features and Disease Phenotypes as Study Entry Criteria for Scleroderma Encompass Patients with Significant Biological Heterogeneity

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Objectives: Clinical trials in systemic sclerosis (SSc) define strict eligibility criteria to overcome the known heterogeneity of the disease. We evaluated baseline circulating cytokines in participants of the Phase I/II Randomized Controlled Clinical Trial of Umbilical Cord-Derived Mesenchymal Stromal Cells in Systemic Sclerosis (CARE-SSc, NCT04356287) to verify this.
Methods: CARE-SSc is a randomized, double-blind, placebo-controlled trial testing the safety and generating preliminary evidence of the efficacy of umbilical cord-derived mesenchymal stromal cells in SSc. The inclusion criteria for CARE-SSc are adults who meet SSc criteria according to the ACR/EULAR 2013 classification criteria with: either a) disease duration of < 2 years with a modified Rodnan skin score (mRSS) > 20 and erythrocyte sedimentation rate > 25 mm and/or hemoglobin < 11 g/dL, or b) mRSS > 15 with at least one major organ involvement (lung, heart or kidneys); inadequate response or adverse effects with standard therapy; and, ineligibility or unwillingness to undergo autologous hematopoietic stem cell transplant. Baseline sera of the first 6 trial participants were analyzed with an extended cytokine/chemokine assay (Human Cytokine/ Chemokine 96-Plex Discovery Assay Array®, Eve Technologies). A non-clustered heatmap was generated using the Matplotlib coding library in Python.
Results: Five women and one man with median age of 46 (range 38-67) years, median disease duration of 3.5 (range 1-14) years and median mRSS of 18 (range 16-22) were included. Four subjects had lung disease and 4 had cardiac involvement. None had renal involvement. Five subjects had anti-topoisomerase I and one had anti-RNA polymerase III antibodies. At baseline, 5 patients were on mycophenolate, 2 on nintedanib and 3 on low dose prednisone (< 10 mg/d). Among the 96 analytes, only 5 (IL-23, SCF, 6CKine, IL-17E, sCD40L) were consistently elevated among all 6 participants. Twenty-one analytes (TSLP, MIP-1β, MIG, MDC, TRAIL, RANTES, M-CSF, IL-27, TGFα, IL-15, IL-12p40, IL-10, PDGF-AA, IL-8, IL-7, IL-5, IL-3, IL-28A, TPO, FLT-3L, and IL-20) were within normal levels in all patients. Of the 3 components of the serum interferon inducible protein score tested (IP-10, MCP-2, MIG/CXCL9), only MCP-2 was above normal in 5 of 6 participants. Although individual pro-inflammatory cytokines were elevated in all participants, the patterns of elevation varied from patient to patient [Fig 1].
Conclusion: Selecting SSc patients based on clinical features results in varied cytokine endotypes. Whether this is associated with variability in treatment responses requires further investigation. If so, it could inform eligibility criteria in future SSc clinical trials.

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Immune Checkpoint Inhibitors: a Pediatric Needs Assessment

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Objectives: Immune checkpoint inhibitor (ICI) therapy is increasing in pediatric oncology. Immune-related adverse events (irAEs) can affect various organ systems, including rheumatic-irAEs (Rh-irAEs) such as inflammatory arthritis, myositis, sicca syndrome, systemic lupus erythematosus, sarcoidosis, and vasculitis [1]. Few case reports detail Rh-irAEs and their management in the pediatric population [2]. Our objective was to assess the familiarity of

pediatric rheumatologists (PR) worldwide with ICI-induced Rh-irAEs, gauge their confidence managing these conditions, and identify knowledge gaps to guide future educational efforts.
Methods: We circulated a 21-question online survey to 2084 PR via the "Dr. Peter Dent Pediatric Rheumatology Bulletin Board." Responses were collected from June 2024 to September 2024. We collected data on practitioner demographics, knowledge of ICIs and Rh-irAEs, confidence in managing Rh-irAEs, and preferred educational resources.
Results: Sixty-nine responses were received of which 55 (80%) were PR from academic centers, and 9 (13%) were from community practices (Table 1.). 24 (35%) had >20 years of clinical experience. Despite global distribution, 56 (81%) of responses came from North America. 34 (49%) of respondents were not aware of ICIs and their related mechanisms, indications, and side effects, and 40 (58%) were not familiar with irAEs. 55 (80%) had never managed a patient with Rh-irAEs. Among those who had (14/69), the median number of cases managed was 2.75 (IQR 1.75). Confidence in managing these conditions was limited: 39 (57%) were “not confident at all” managing Rh-irAEs, 34 (49%) were “not confident at all” managing pre-existing autoimmune diseases (PAD) in ICI users, and 46 (67%) were “not confident at all” advising oncology colleagues on initiating or discontinuing ICIs in the context of Rh-irAEs or PADs. No one felt “completely confident” managing these conditions. Several knowledge gaps were identified: 59 (86%) in long-term management, 55 (80%) in acute management, and 51 (74%) in recognition and diagnosis. 43 (62%) indicated the need for pediatric-specific clinical guidelines. Of the 14 (20%) respondents with clinical experience treating Rh-irAEs, initial treatment approaches varied, with 4/14 (29%) using NSAIDs, 3/14 (21%) using prednisone, and 4/14 (29%) combining prednisone with methotrexate. Long-term management also varied, with 5/14 (36%) using methotrexate, and 3/14 (21%) using TNF inhibitors.
Conclusion: Significant knowledge gaps and a lack of confidence exist among PR in managing ICI-related Rh-irAEs. As ICI use increases in pediatric oncology, PR exposure to Rh-irAEs will follow. Targeted educational programs and clinical guidelines will be valuable to address these gaps and improve patient care.

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Confidence Check: Closing the Educational Gaps in Immune Checkpoint Inhibitors

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Objectives: The growing use of immune checkpoint inhibitors (ICIs) in pediatric oncology has introduced pediatric rheumatologists (PR) to immune-related adverse events (irAEs), including rheumatic-irAEs (Rh-irAEs) [1]. These novel conditions prompt a need for learning around their presentation and complex management issues, especially due to the lack of pediatric-specific guidelines. Currently, there is limited understanding of PRs' familiarity with ICIs and Rh-irAEs, as well as their educational needs. This study aimed to identify these gaps and explore PRs' preferred learning formats to inform future educational offerings.
Methods: Eight learning-related questions were incorporated into a 21-question online survey assessing PRs' knowledge of Rh-irAEs. The survey was distributed to 2,084 PRs globally via the

"Dr. Peter Dent Pediatric Rheumatology Bulletin Board," and responses were collected between June and September 2024.
Results: A total of 69 responses were received, 55 (80%) from academic centers and 9 (13%) from community practices. Despite global outreach, 56 (81%) responses were from North America (Table 1). Confidence in managing these conditions was limited: 39 (57%) were “not confident at all” managing Rh-irAEs, 34 (49%) were “not confident at all” managing pre-existing autoimmune diseases (PAD) in ICI users, and 46 (67%) were “not confident at all” advising oncology colleagues on initiating or discontinuing ICIs in the context of Rh-irAEs or PADs. No one felt “completely confident” managing these conditions. Knowledge gaps were identified by participants in the following areas: long-term management (86%, 59/69), acute management (80%, 55/69)), and in recognition and diagnosis (74%, 51/69). 43/69 (62%) indicated the need for pediatric-specific clinical guidelines. Awareness of existing educational resources was limited: 39/69 (57%) were unaware of the EULAR Guidelines for managing irAEs, 65 (94%) were unaware of CanRIO’s learning modules or case rounds, and 33 (48%) were unaware of any educational resources. Interest in learning was high, with 63 (91%) expressing willingness to participate in educational activities. The preferred formats were online modules, podcasts, or webinars (64%), self-directed learning (49%), and group-scheduled activities (43%). Conference-based content was favored over local content (55% vs. 26%), and only six participants showed no interest.
Conclusion: PRs are eager to learn more about ICI-induced Rh-irAEs, with a clear preference for diverse educational formats. Future steps include designing and implementing educational activities focused on these knowledge gaps and learning preferences, followed by reassessing PRs' competency in this emerging area.

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Preliminary Results of a Pilot Randomized Controlled Trial: Feasibility and Acceptability of a Virtual Adolescent Self-Management Program for Juvenile Idiopathic Arthritis

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Objectives: A needs assessment of adolescents with juvenile idiopathic arthritis (JIA) have revealed significant gaps in addressing adolescent needs during the transition to adult care. We conducted a preliminary investigation of the Virtual Adolescent Self-Management Program (VISTA) for adolescents with JIA in Canada. The aim of this project was to evaluate and improve the feasibility and acceptability of the program for future implementation.
Methods: This is a multicenter study using a Randomized Controlled Trial (RCT) design to

assess the feasibility and acceptability of a self-management program for adolescents with JIA. The target is to recruit 100 subjects in total. One of the five Canadian sites recruited and enrolled patients into one of two groups: (a) a remote intervention versus (b) a wait-list control group. Nine individuals were recruited and randomized, with five assigned to the intervention group and four to the control group. Participants in the intervention group attended four 60–90 minutes education sessions (overview and diagnosis of JIA, daily living and exercise, coping strategies, and treatment and lifestyle management) over 8 weeks via Zoom. Both groups completed questionnaires at baseline (T0) and after the intervention was completed (T1). Following the program's completion, participants in the intervention group were invited to take part in an optional semi-structured interview to provide feedback.
Results: All participants completed the baseline and post-intervention questionnaires. Participants in the intervention group attended all four sessions of the program and four out of five participated in the optional interview. Two out of four participants in the control group indicated interest in completing the intervention if given the opportunity. All intervention participants indicated that they would attend the program again and think other teens would be interested. They commented positively on the information provided and the ability to connect with other teens with JIA. However, there was consensus among participants that the sessions felt too long and mixed responses regarding whether the program was sufficiently interactive.
Conclusion: The preliminary investigation into the virtual self-management program for adolescents with juvenile idiopathic arthritis demonstrated both feasibility and positive reception. While feedback indicated that session length could be reduced and there were differing views on the program's interactivity, the overall response was favorable. These insights will inform future program adaptations to better meet the needs of adolescents with JIA, ensuring the program is accessible and engaging. The recruitment in ongoing at all sites to reach target of 100 participants in total.

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Uncovering Rheumatologic Disease in the Northwest Territories: First Comprehensive Baseline Study and Comparative Insights

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Objectives: This study aims to capture baseline demographic and rheumatologic history of patients referred from the Northwest Territories (NWT), for which available data is both scarce and outdated, to identify areas for patient care improvement in a unique and underserved population.
Methods: In 2022-2023, the NWT Health and Social Services Authority redirected all known established and newly referred Rheumatology patients to receive care in Edmonton. This provided a unique point-in-time opportunity to collect and report baseline information in the Alberta Health Services electronic record, ConnectCare, including demographics, disease history, and follow-up times; and to compare results with an Edmonton Rheumatology patient cohort.
Results: 425 patients were identified (70% female). Of 251 patients with documented ethnicity, 69%, 26%, 4%, and 1% were of Indigenous, Caucasian, Asian, and African descent, respectively. 288 (68%) previously saw Rheumatology in NWT; the remainder were new

referrals. Most frequent diagnoses in established patients were rheumatoid arthritis (RA, 47%), psoriatic arthritis (PsA, 16%), and ankylosing spondylitis (AS, 10%); this includes 50 patients who were not assessed due to patient no-show or cancellation. Patients waited, on average, 1.9 years from their last rheumatology visit. For new referrals, 76 (55%) received degenerative/mechanical or non-rheumatic diagnoses; 18% canceled or did not show. Of the remaining 36 patients, top diagnoses were RA (28%), gout (14%), PsA (11%), and AS (11%) Top new rheumatologic diagnoses from 2022-2023 in the Edmonton area seen by Rheumatologists using ConnectCare were RA (26%), crystal arthropathy (11%), and vasculitis (9%), with PsA and AS each comprising ~7%. 1 patient overall was diagnosed with vasculitis in the NWT cohort, compared to 4% in the entire Edmonton cohort.
Conclusion: Our study provides the broadest epidemiologic dataset of patients with rheumatologic diseases in the Northwest Territories and is the first to comprehensively differentiate between the various rheumatologic diseases seen in this population. Interestingly, there is a signal of higher rates of psoriatic arthritis and ankylosing spondylitis, and lower rates of vasculitis, compared to historical data in the Edmonton catchment areas. Furthermore, 86 patients (20%) were not assessed due to patient cancellations or no-shows; in addition to a nearly 2-year wait-time for established patients, this highlights issues in care for both new and established disease. Given the population demographics, this may disproportionately impact Indigenous and female patients, but whether this is due to a flawed referral process or travel limitations requires further exploration.

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Dmard Utilization Patterns in Community-Dwelling Rheumatoid Arthritis Patients: Insights from Linked Primary Care and Pharmaceutical Data

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Objectives: To examine disease-modifying antirheumatic drug (DMARD) dispensation patterns among rheumatoid arthritis (RA) patients in primary care settings and explore associations between patient/physician characteristics and DMARD utilization.
Methods: This retrospective cohort study utilized linked primary care electronic medical records (EMRs) from the Southern Alberta Primary Care Research Network with provincial pharmaceutical dispensation data. We analyzed DMARD dispensation patterns for 597 RA patients aged ≥19 years with at least one primary care encounter between 2008-2020. Logistic regression was used to examine associations between patient/physician characteristics (age, sex, rurality/urbanicity, deprivation category) and DMARD utilization.
Results: Of 597 RA patients (72% female, mean age 55 years), 67% were dispensed at least one DMARD during the average 7-year follow-up. Notably, 58% had DMARD dispensations before RA documentation in their EMR, likely due to PCPs recording diagnosis after specialist confirmation and treatment initiation. Methotrexate (76%) and hydroxychloroquine (74%) were the most commonly dispensed DMARDs. Patients with no DMARDs dispensed were younger at

diagnosis (mean age 52 vs. 56 years) and more likely to live in deprived areas [Table 1]. Among patients with an incident diagnosis of RA in the primary care EMR, 383/597 used conventional DMARDs, 169/597 advanced therapies (targeted synthetic or biologic), and 17/597 biologics without conventional DMARDs. These prescriptions spanned the entire follow-up period, with incident RA defined using a 2-year run-in period to account for prevalent cases.
Conclusion: This study suggests potential disparities in DMARD utilization, with younger patients and those from deprived areas less likely to have DMARD dispensations. However, further research is needed to explore whether these differences reflect true disparities in prescribing practices or other factors such as prescription filling behaviors, concerns about medication costs, or delays in obtaining subsidized drug coverage. Future studies should also investigate the coordination between specialists and primary care providers in RA management. These insights could inform targeted interventions to address potential socioeconomic disparities in RA care and improve treatment access and adherence. Table 1. Characteristics of patients who received DMARDS compared to those who did not, linked dataset

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Bridging the Gap: Prednisone Use Patterns in Primary Care Reveal Challenges in Rheumatoid Arthritis Management and Access to Specialist Care

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Objectives: To examine prednisone prescribing patterns and use among rheumatoid arthritis (RA) patients in Canadian primary care settings, exploring adherence to current guidelines and identifying factors influencing prescribing practices.
Methods: This mixed methods study explored perspectives on RA care access through: Qualitative interviews with 33 people living with RA (PlwRA) across Canada Three focus groups with primary care providers (14 physicians, 1 manager, 1 pharmacist) in Alberta Quantitative analysis of prescribing patterns for 597 RA patients (2008-2020) using linked primary care electronic medical records (EMR) and pharmaceutical data from Southern AlbertaPlwRA interviews were guided by the Candidacy Framework [1] and a critical interpretive synthesis of RA literature [2]. Logistic regression analyzed associations between patient/physician characteristics and prednisone use. This approach combined in-depth individual perspectives with broader, generalizable data on RA care access and management.
Results: Among 597 RA patients identified from primary care EMR, annual point prevalence for prednisone (oral and injection) dispensing increased from 16% in 2008 to 29% in 2020. 65% of RA patients had at least one prednisone dispensation during the study period. Patients with higher comorbidity scores (calculated for the entire period of data capture) were more likely to receive prednisone (OR 1.20, 95% CI 1.02-1.41) [Table 1]. 83% of 597 patients with incident DMARD prescriptions also had prednisone prescriptions, indicating its use as bridging therapy. Qualitative data also revealed PCPs' reliance on prednisone for symptom management during long waits for rheumatologist consultations when no DMARDs were available to them, which

ranged from less than a month to over two years. PlwRA reported diverse experiences with prednisone, from reluctance due to side effects to dependence for symptom control over extended periods of time.
Conclusion: Prednisone use in RA management often extends beyond the short-term use recommended in current guidelines, largely due to systemic challenges in accessing timely rheumatology care. While serving as crucial bridging therapy, prolonged prednisone use (continuous use exceeding three months) raises concerns about long-term risks. These findings highlight the need for improved care pathways and closer collaboration between rheumatologists and primary care providers to optimize RA management and reduce reliance on extended prednisone use.

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Description of Immune Checkpoint Inhibitor Associated Sicca-Like Syndrome from the Canadian Research Group of Rheumatology in Immuno-Oncology Database: A Case Series

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Objectives: Immune checkpoint inhibitors (ICIs) are a revolutionary cancer treatment that block inhibition of T cells, promoting immune-mediated clearance of malignancies. Decreased regulation of T cells can have many off-target effects, including the development of xerostomia and xeropthalmia, also called ICI-sicca syndrome [1]. ICI-sicca syndrome appears to be pathophysiologically distinct from Sjögren's syndrome [2], though predictors of sicca development in ICI patients have not been well characterized. The development of sicca syndrome can seriously impact patient quality of life, causing lifelong toxicity to oral and ocular health. Reporting of sicca symptoms in randomized controlled trials is not currently standard. Little is known about the clinical presentation, response to treatment, and prognosis of those who develop ICI-sicca syndrome. Our objective was to characterize sicca symptom manifestation, management, and outcomes in patients treated with ICIs using the Canadian Research Group of Rheumatology in Immuno-Oncology (CanRIO) prospective and retrospective cohort databases.
Methods: We identified forty cases of sicca symptoms after exposure to ICI treatment in the CanRIO database. In this study, we describe the characteristics of these cases of ICI-sicca syndrome including cancer and ICI treatment history, sicca symptom history, other immune related adverse events (irAEs), medical management of irAEs, and investigations undertaken.
Results: Of the forty patients identified with sicca-like symptoms, nineteen (47.5%) were treated with anti-PD-1 monotherapy, fifteen (37.5%) with combination anti-PD-1 and anti-CTLA-4, and six (15%) with anti-PD-L1 monotherapy. Thirty-five records contained information on the sicca

symptom CTCAE grade; of these, fifteen patients (42.9%) were recorded with grade 1 sicca symptoms, fourteen (40%) grade 2, and six (17.1%) grade 3. Only three patients had previously experienced sicca-like symptoms, and thirty-two presented with additional irAEs. Serologies showed a distinctly different pattern from Sjögren's syndrome, with 37.9% positive for ANA, 13.8% positive for rheumatoid factor, 34.6% positive for anti-Ro, and 4.2% positive for anti-La. Of this cohort, 72.7% had management initiated specifically for sicca symptoms, including topical management, pilocarpine, systemic glucocorticoid, and ICI pause or cessation. Fourteen of sixteen patients reported partial or complete resolution of their sicca symptoms with treatment. **Conclusion:** To date, this is the largest case series on sicca treatments and outcomes in ICI-treated patients worldwide. ICI-induced sicca, in contrast to traditional Sjögren's syndrome, appears to be highly responsive to immunosuppressive treatments. This work characterized a wide range of treatment modalities and may assist those involved in ICI-treated patients' care to initiate therapy and reduce the risk of serious complications of sicca syndrome.

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Cancer Trends in Idiopathic Inflammatory Myopathy: A Population-Based Study

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Objectives: To assess trends in cancer incidence among patients with dermatomyositis (DM) and polymyositis (PM) compared to the general population.
Methods: A retrospective cohort was assembled using administrative health data from British Columbia, Canada from 1997-2020. Incident cases of DM and PM were identified using ICD-9 and ICD-10 codes. General population controls were matched 10:1 on gender, age, and index year. The cohort was divided into early (1997-2008) and late (2009-2020) periods. Cancer incidence was determined using the Cancer Registry Database. Cancer cases were included between incident diagnosis date and the end of the early/late period. Multivariable quasi-Poisson regression models were used to estimate relative risk of cancer compared to controls, adjusting for potential confounders. Interaction terms were included to assess trends in cancer risk.
Results: Dermatomyositis: In the early cohort of 449 individuals (37.6% male, mean age 52.8 years), there were 47 cancer diagnoses (incidence rate (IR) of 25.3 per 1,000 person-years). There were 1,331 individuals in the late cohort (34.8% male, mean age 53.2 years), with 135 cancer diagnoses (IR of 23.1 per 1,000 person-years). The incidence rate ratio (IRR) for cancer compared to the general population was 2.21 for the early cohort (95%CI: 1.40-3.42, $p<0.01$) and 2.00 for the late cohort (95%CI: 1.41-2.80, $p<0.01$). The adjusted relative risk for cancer in the late compared to the early cohort was 0.84 (95%CI: 0.57-1.26, p0.376). The most common cancers in DM were lung, gastrointestinal, urological and gynaecological. Polymyositis: In the early cohort of 890 individuals (43.1% male, mean age 55.9 years), there were 60 cancer diagnoses (IR of 14.3 per 1,000 person-years). The late cohort comprised 1,851 individuals (42.9% male, mean age 57.7 years), with 137 cancer diagnoses (IR of 15.75 per 1,000 person-years). The IRR for cancer compared to the general population was 1.06 for the early cohort (95%CI: 0.73-1.52, p0.742) and 1.07 for the late cohort (95%CI: 0.80-1.42, p0.65). The adjusted

relative risk for cancer in the late compared to the early cohort was 0.93 (95%CI: 0.65-1.32, p0.672). The most common cancers in PM were urological, gastrointestinal, lung, and breast. Further analysis provided in [Table 1].
Conclusion: Unlike PM, early and late DM cohorts both have significantly higher rates of overall cancer compared to the general population. No significant trends in overall cancer incidence were observed among patients with DM or PM in this study. Similar to the existing literature, the most common cancers were lung, gastrointestinal, urological, gynaecological and breast.

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Long-Term Outcomes in Lung Transplant for Anti-Melanoma Differentiation-Associated Gene 5 Antibody Positive Interstitial Lung Disease: A Case Series

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Objectives: To evaluate the long-term outcomes of patients who survived the first year after lung transplant for interstitial lung disease (ILD) secondary to anti-melanoma differentiation-associated gene 5 antibody (MDA5).
Methods: A retrospective chart review was conducted for patients who survived lung transplant (with transplant date between 2017 and 2020) for anti-MDA5 associated ILD, with a minumum of 48 months follow up, in British Columbia, Canada. This project received ethical approval from the University of British Columbia.
Results: Five patients were identified, three females (60%) and two males, mean age at diagnosis of idiopathic inflammatory myopathy (IIM) was 43.2 years old, with a mean follow-up time of 73 months. Two patients were Chinese (40%), one patient was White (20%), one patient was Filipino (20%), one patient's ethnicity was not recorded (20%). Four patients presented with rapidly-progressive interstitial lung disease (RP-ILD) (decline within three months of ILD onset), the other had progressive ILD over 12 months and pneumomediastinum. All patients were immunosuppressed prior to transplant; with glucocorticoids (GC) (n=5), cyclophosphamide (n=3), rituximab (n=3), IVIG (n=3), mycophenolate mofetil (MMF) (n=2), tacrolimus (n=1), azathioprine (n=1), ciclosporin (n=1), and hydroxychloroquine (n=1). All patients remain on immunosuppression; GC, tacrolimus and MMF triple therapy in all patients (n=5) and two patients treated with the addition of monthly IVIG (n=2). The most common complications were infections; nine incidences of lung allograft infection were reported. Other infections included COVID19 (n=3), shingles (n=2), CMV viraemia (n=1), EBV viraemia (n=1), bacteraemia (n=2), UTI (n=1) and parapneumonic effusion (n=1). There were no fungal infections. Two patients had acute cellular rejections (resolved), one patient had chronic allograft dysfunction causing airflow obstruction, and two patients had restrictive lung defects from baseline after transplant. Heart failure with preserved ejection fraction (HEFPEF) occurred in two patients within the first year after transplant. There have been no flares of underlying auto-immune disease. None of the patients have required long term oxygen therapy and all patients are able to perform usual activities of daily living. Detailed case review is displayed in [Table 1].
Conclusion: This is the first study of long term follow up in this patient group. Infections were common but all resolved. HEFPEF was seen in 40% of patients, despite it being uncommon in

the general population. This case series provides evidence that patient who survive lung transplant can have good long-term respiratory and functional outcomes.

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Expanding the Clinical Spectrum of Myositis with Prominent B Cell Aggregates (Bcm)

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Objectives: Myositis with prominent B-cell aggregates (BCM) is an uncommon finding on muscle biopsy. The initial clinical phenotype of BCM was described in a series of 10 cases as brachio-cervical inflammatory myopathy (i.e., predominantly upper more than lower extremity and neck extensor weakness) associated with other autoimmune diseases including rheumatoid arthritis. Since then, only a handful of cases have been reported, including patients with an inclusion body myositis (IBM)-like phenotype. Considerable knowledge gaps remain for this entity.

Methods: We aimed to describe the clinical and serological characteristics of subjects in the Canadian Inflammatory Myopathy Study (CIMS) cohort with prominent B-cell aggregates (BCM) on muscle biopsy (≥30 CD20+/aggregate). A retrospective study was performed comparing myositis cases and controls with and without BCM on muscle biopsy, respectively. Controls were classified according to clinico-sero-pathological features, as dermatomyositis (DM), overlap myositis (OM) and IBM.

Results: In this series of 70 subjects, 23 had BCM, 21 had DM, 17 had OM, and 9 had IBM (Table 1). There were more men in the BCM group compared to the DM group (6/23 vs 1/21), and BCM cases were older than OM cases (mean age 53 vs 46 years). BCM subjects had both upper (83%) and lower (78%) extremity weakness, with upper extremity being weaker than lower extremities in 41% of cases. A greater proportion of BCM patients were weaker proximally (52%) compared to IBM patients (22%). Neck flexor weakness was frequent (74%), while neck extensor weakness was uncommon (12%). Most BCM subjects (91%) had associated autoimmune disease: 14 had systemic sclerosis, 5 rheumatoid arthritis, and one patient had masticatory muscle weakness with anti-AChR antibodies. Extra-muscular features found in BCM patients included inflammatory arthritis (50%), Raynaud's phenomenon (30%), DM rash (26%) and interstitial lung disease (22%). The most common myositis-associated autoantibodies in the BCM group were anti-PM-Scl (7/23), -Ku (3/23), -Ro52 (3/23), -CENP (2/23), -RF/-CCP (2/23) and -Mi-2 (1/23). Five BCM subjects had no myositis-specific or myositis-associated antibodies. For treatment, 39% of BCM subjects received rituximab, compared to 18% in OM and 10% in DM.

Conclusion: In this largest series of BCM reported to date, we found similarities (concomitant autoimmune diseases) and differences (muscle weakness distribution) with previously reported cases. BCM is a distinct histopathological entity found in several myositis subsets (OM, DM),

and the presence of prominent B-cell aggregates on muscle biopsy might provide a potential therapeutic target.

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Case Series of Six Patients with Inflammatory Myositis Seen at a Specialized Pregnancy and Rheumatic Diseases Clinic

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We used a prospective registry of patients seen at PReDICT and identified those with dermatomyositis or polymyositis between 2021-2024. Six patients with DM, who were managed at PReDICT throughout the three trimesters of pregnancies and 6 weeks postpartum, were included in the study.

Five of the patients had a pre-existing diagnosis of DM prior to pregnancy. One patient presented with new diagnosis of DM in the 1st trimester of pregnancy. Patients who had pre-pregnancy counseling had low disease activity at conception, and conceived on pregnancy compatible medications. One patient (Patient 2) experienced a possible flare during pregnancy during the 2nd trimester, manifesting as dyspnea, hoarseness of voice, and dysphagia, and requiring increase in dose of prednisone from 5 mg to 10 mg. One patient (Patient 3) experienced a postpartum flare involving both the skin and muscles which required initiation of Tacrolimus and IVIG. All other patients remained in remission (Patients 1 and 5) or stable low disease activity (Patients 4 and 6); postpartum information for Patient 2 is not available. All pregnancies resulted in live births. Infant 2 was born prematurely (34+3 weeks) and admitted to NICU for blood glucose monitoring and feeding support. Infant 4 experienced severe combined immunodeficiency due to in-utero azathioprine exposure. Pregnancy outcomes are summarized in table 1.

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Distinct Systemic Sclerosis Phenotypes Related to Race/ethnicity: an Opportunity to Personalize Care?

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Lady Davis Institute for Medical Research, Montreal); Sabrina Hoa (Rheumatology Division, Department of Medicine, Centre hospitalier de l'Université de Montréal (CHUM), Montreal)
Objectives: To describe and compare systemic sclerosis (SSc) phenotypes according to race/ethnicity.
Methods: SSc patients enrolled in the Canadian Scleroderma Research Group cohort from 2004 to 2020 were included. Demographic, clinical and serological characteristics at baseline were collected using standardized questionnaires. Race/ethnicity was self-reported by participants, who were asked to identify with 1 (or more) of the following groups: White, Chinese, South Asian, Black, Filipino, Latin American, Southeast Asian, Arab, West Asian, Japanese, Korean, Indigenous (First Nations, Metis, Inuit) or none of the above. We compared clinical characteristics and serology, according to race/ethnicity.
Results: Of the 1727 CSRG participants, 80% indicated White race/ethnicity (n=1385), 5 % Indigenous (n=79), 3% Latin American (n=58), 1.6% Middle Eastern (n=27), 1.5% East/Southeast Asian (n=26), 1.2 % Black (n=21) and 0.8 % South Asian (n=12). Differences in demographic, clinical and serological characteristics according to race/ethnicity are highlighted in Table 1. White individuals were older at cohort entry and more frequently had limited SSc. Most SSc subjects were women, but men were affected in higher proportions among South Asians (39%) and East/Southeast Asians (23%). Although Raynaud's phenomenon is almost universal in SSc, its prevalence was slightly lower among East/Southeast Asians (86%), who also had numerically lower frequency of digital ulcers (29%). Arthritis was relatively common among Latin Americans (55%), Blacks (47%) and possibly Indigenous individuals (39%) versus Whites (29%). Blacks also had higher frequency of diffuse SSc (67%), telangiectasias (79%) and myositis (40%), and the lowest mean pulmonary function test values. Indigenous individuals had higher prevalence of lower gastrointestinal involvement, including malabsorption (22%), bacterial overgrowth (15%) and need for hyperalimentation (9%). In regard to serological profiles, anti-centromere autoantibodies were positive in about one third of SSc patients, but rare among Black individuals (6%). Anti-topoisomerase I autoantibodies were present in about one third of Latin American, Black, East/Southeast Asian, Middle Eastern and South Asian patients, but in only 13% of White and Indigenous individuals. Finally, anti-RNA polymerase III autoantibodies were overrepresented among Indigenous individuals (30%).
Conclusion: In this Canadian cohort, race/ethnicity was associated with distinct SSc phenotypes. Some of these findings may be due to genetic factors, but some findings may be related to referral patterns or migration trends. Additional investigations are underway to better understand our findings. If validated, the results could help personalize care in SSc.

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Is It Really "just Fatigue" in Patients with Systemic Autoimmune Rheumatic Diseases(Sards): Applying the Case Definition of Chronic Fatigue Syndrome in Patients with Sards-A Pilot Study

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Objectives: Systemic autoimmune rheumatic diseases (SARDs) (e.g. Systemic sclerosis (SSc) and systemic lupus erythematosus (SLE) are inflammatory diseases that result in a substantial reduction in quality of life. Patients with SARDs often develop symptoms of fatigue and pain akin to patients with myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) and fibromyalgia (FM). To date, it is unclear how common ME/CFS-like symptoms are in different SARDs. In this pilot study we sought to determine frequency of ME/CFS and FM manifestations in patients with SLE and SSc and to examine severity of associated disability.
Methods: We conducted a cross-sectional study with SSc (n=49) and SLE (n=38) patients from a single center. Patient-reported outcomes were gathered using validated patient-reported questionnaires that assessed the severity of fatigue, pain, cognitive impairment, disability, quality of life and clinical parameters. Statistical analysis including chi-square and Wilcoxon-rank sum test were carried out using STATA-17 and utilized to link parameters associated with ME/CFS and FM with disease-associated values.
Results: A total of 25 (51%) SSc patients and 19 (50%) SLE patients were classified as suffering from co-morbid ME/CFS (SSc-CFS and SLE-CFS). ME/CFS in both SSc and SLE was associated with FM and cognitive impairment ($p<0.05$). SSc-CFS and SLE-CFS patients also had poorer quality of life, greater disability, and more pain compared to non-CFS patients ($p<0.001$). SSc-CFS was not associated with autoantibodies, CRP, disease duration, or organ damage. Similarly, SLE-CFS was not associated with ds-DNA antibody, CRP or disease activity, although it was associated with longer disease duration ($p=0.046$). A comparison of SSc-CFS and SLE-CFS patients revealed similarities in the degree of disability and associated reduction in quality of life. However, ME/CFS-like symptoms in SSc-CFS and SLE-CFS were different. Specifically, SSc-CFS patients had more severe fatigue, whilst SLE-CFS patients had more profound cognitive dysfunction – suggesting that biological differences may be present.
Conclusion: Properties associated with ME/CFS are similar between SSc and SLE patients but not the same, with differences in the severity of fatigue and cognitive impairment. Future confirmation of these findings in larger cohorts, and exploration of their molecular mechanisms may result in a deeper understanding of these symptoms in SARDs. This work may expand on existing work describing the “type 2” lupus subtype with similar symptoms and result in novel therapeutic approaches.

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Identifying Differentially Expressed Micro-Rnas for Treatment Response to Tnf Inhibitors and Il-17 Inhibitors in Psoriatic Arthritis

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Objectives: Micro-RNAs (miRNAs) are stable, specific and can make good candidates for biomarker research. We aimed to (i) Identify differentially expressed miRNAs in serum samples of Psoriatic Arthritis (PsA) patients that can predict response to Tumor necrosis factor inhibitor (TNFi) or Interleukin-17 inhibitor (IL-17i) (ii) Identify biologic pathways enriched by the

identified miRNAs
Methods: From our prospective PsA database, patients satisfying CASPAR criteria and initiating biologic disease-modifying anti-rheumatic drugs (bDMARDs); TNFi or IL-17i, were identified. Biobanked serum samples before initiation of treatment and after 6 months were retrieved. miRNA expression in serum samples was measured with next-generation sequencing. Articular response was defined as achieving a low disease activity or remission according to DAPSA (<14) and a cutaneous response as achieving at least a 50% reduction in PASI. An unpaired Student's t-test was used to compare the distributions of quantitative variables between responders and non-responders in the IL-17i and TNFi groups. Furthermore, enrichment of specific biologic pathways corresponding to the identified miRNAs was examined using pathDIP v.5. Analysis was restricted to literature curated pathways and experimentally detected protein-protein interactions with a prediction confidence of 0.99.
Results: 74 patients have been included so far (Table 1). Articular and cutaneous response to IL-17i was observed in 55.6% and 22.2% of patients, respectively. Likewise, articular and cutaneous response to TNFi was observed in 65.8% and 26.3% of patients, respectively. No miRNAs showed significant differences in expression between responders and non-responders at baseline ($p< 0.05$). However, miRNA miR-1246 showed the most difference in expression ($|logFC|>1$) between responders and non-responders (for both articular and cutaneous criteria) in patients treated with IL-17i. In patients treated with TNFi, miR-11400 and miR-1277-3p showed the most difference ($|logFC|>1$) between cutaneous responders and non-responders, while miR-11400 also showed the most difference ($|logFC|>1$) between articular responders and non-responders. When patients were stratified by changes in swollen joint count, miR-1246 at baseline was significantly lower ($log FC = -9.89$, $p = 0.02$) in IL-17i treated patients showing any reduction in swollen joints. The most commonly targeted pathways by miR-1246 were related to bone formation and regeneration, cell proliferation and apoptosis, including the non-canonical Wnt, PI3K-AKT-mTOR and Rho GTPases signaling pathways.
Conclusion: Deregulation of miRNAs was observed between responders and non-responders of biologic treated patients. Further analysis is required to better understand the role of these miRNAs in PsA inflammatory mechanisms which can help with selection of effective treatments and provide better disease outcomes for patients.

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Improved Rates of Successful Transfer of Care of Young Adults with Juvenile Idiopathic Arthritis with the Implementation of a Multi-Disciplinary Transition Clinic

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Objectives: This study aimed to evaluate the efficacy of the implementation of a comprehensive juvenile idiopathic arthritis (JIA) transition clinic in improving the rates of successful transfer from a pediatric rheumatology team to an adult rheumatologist.
Methods: We conducted a retrospective systematic chart review of all patients with JIA who attended their final Montreal Children's Hospital appointment between 1992 and 2005 and compared them with the cohort who had their final appointment between 2013 and 2021. We tracked these patients for two years after transfer to an adult rheumatologist. If the patient never

made contact with the identified adult rheumatologist or was lost to follow up at two years, then this patient was deemed an unsuccessful transfer. Within the post-intervention group, we compared characteristics of patients with successful and unsuccessful transfers of care and looked at the services they received in the transition program. Variables pertaining to sex, disease characteristics, disease severity, psychosocial factors and the number of allied health care appointments attended as part of the multi-disciplinary program were examined. Univariate analyses were performed to assess factors associated with the outcome of successful transfer of care.
Results: In the pre-intervention cohort, 100 patient charts were reviewed. This was compared with 152 charts from the post-intervention cohort. Following the introduction of a multidisciplinary transition clinic, our rate of successful transfer increased from 48% in the pre-intervention period to 94% in the post intervention cohort (See Table 1). Variables related to disease characteristics did not predict successful transfer of care. However, patients in the post-intervention group who attended more than 2 supplemental allied health appointments were more likely to have a successful transfer of care OR 14.3 (CI= 2.89-70.92).
Conclusion: In the pre-intervention cohort, the 52% rate of unsuccessful transfer from pediatric to adult care mirrored the rates seen in other pediatric chronic illnesses. The improvement that we have seen in this rate reflects a sustained effort to address the unique needs of this patient population. We cannot draw conclusions about the value of any individual service offered through our transition program due to small numbers in the study. However, the inclusion of multiple allied health services did seem to improve overall outcomes, supporting our approach of a patient-centred model of transition of care.

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Economic Evaluation of Including Biomarker-Testing in the Biologic Therapy Withdrawal Decision Making Process in Non-Systemic Juvenile Idiopathic Arthritis: the International Ucan Candu and Cure Study

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Objectives: To assess the cost-effectiveness of including biomarker-testing in the decision-making process of withdrawing biologic therapy for patients with non-systemic JIA compared to usual care.
Methods: A health economic model was developed to assess 3 different scenarios reflecting decision-making in response to biomarker information and what percentage of patients start biologic therapy withdrawal early (within 2 years after reaching inactive disease) including 20%, 46% and 75%, compared to usual care (74%). A one-month cycle length and ten-year time horizon were used. Transition probabilities, costs and effects were based on data from the UCAN CAN-DU cohorts (in The Netherlands and Canada), and the Wilhelmina Children’s Hospital

(Utrecht, the Netherlands), plus clinical expert opinion and the literature. Costs include drugs, biomarker testings, paediatric rheumatology visits and other hospital related costs, such as radiology investigations, laboratory testing and hospitalization. Effects were measured in quality-adjusted life years (QALYs). A probabilistic analysis was performed to reflect uncertainty
Results: In the analysis we compared usual care to each individual scenario. The percentage of flare-ups within the 1st year of stopping biologics are 62% for usual care, compared to 43%, 50% and 57% respectively. In usual care, the average time in active disease per patient is 25 months (21%), where the scenarios show 23 months (19%), 24 months (20%) and 25 months (21%). The average time off biologics in Usual care is 26 months (22%), where the scenarios show 26 months (22%), 29 months (24%), 30 months (25%). The absolute costs are €79,051 for usual care, compared to €78,315, €77,354, and €76,745 respectively, resulting in incremental costs of €-737, €-1,697, and €-2,306. The absolute QALYs are 7.470 for usual care, compared to 7.535, 7.521, and 7.490 respectively, resulting in incremental QALYs of 0.065, 0.051 and 0.020. The incremental cost-effectiveness ratio for each scenario is €-11,254/QALY, €-33,301/QALY and €-117,145/QALY. The Net Health Benefit, for a willingness-to-pay (WTP) threshold of €50,000/QALY, is 0.080, 0.085 and 0.066. For this WTP, the probabilistic analysis shows that the probability of biomarker testing being cost-effective was 100% for all scenarios.
Conclusion: The inclusion of biomarker testing in the decision-making process of withdrawing biologic therapy in JIA is likely to be cost-effective. The benefits of biomarker-guided therapy withdrawal are preference sensitive and will depend on the balance between how patients/families and physicians tradeoff between time-off biologics (and consequently cost-savings) and the (avoidable) risk of flare-up due to early withdrawal.

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How Does Juvenile Idiopathic Arthritis Affect the Work and Usual Activities of Parent Caregivers? The Ucan Can-Du and Cure International Prospective Study

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Objectives: To measure the impact of Juvenile idiopathic arthritis (JIA), on the work productivity and daily activities of caregivers over time, and investigate factors affecting these impacts.
Methods: The Canada-Netherlands Personalized Medicine Network in Childhood Arthritis and Rheumatic Diseases (UCAN CAN-DU) and CURE study captures consecutive caregiver reported data including the standardized instrument Work Productivity and Activity Impairment (WPAI) questionnaire. The cohort includes all subtypes of JIA, and patients across the disease trajectory from new diagnosis to starting or stopping biologics. Generalized estimating equations (GEE) were used to model productivity loss, activity impairment, and wages lost due to the child's JIA over a 1-year-period from study enrollment. Covariates included JIA disease activity state (e.g., inactive, minimal, moderate/high), time from enrollment (i.e., baseline, 3, 6, 9, 12

months), patient age group (i.e., 0-4, 5-9, 10-15, 16+ years), JIA clinical diagnosis (yes or no), and patient age at diagnosis.
Results: Overall, 703 caregivers were included who had at least one WPAI entry during the 1-year period from enrollment in the study. Most caregivers were mothers (84%), median age of 42 years (IQR = 37-49). A change in work commitment in the last year was reported by ten percent of caregivers, mostly reducing working hours (8%). The GEE estimates are as follows. Over a one-year period, we estimate 6% of missed work time due to their child's JIA (absenteeism). Parents reported that 12% of their time at work was impaired (presenteeism). Accounting for both, caregivers work productivity decreased 17% on average. They also experienced impairment in 12% of their usual activities. Absenteeism resulted in an estimated average annual wage loss of €3,759 per family. Work productivity loss, activity impairment, and wage loss varied by JIA activity levels, with caregivers of children with more severe JIA (higher disease activity) experiencing higher levels of burden.
Conclusion: Our study is the first to capture work productivity loss and activity impairment for caregivers of children with all subtypes of JIA and account for clinical features such as disease activity, and formal diagnosis. Future work should further investigate the determinants of productivity loss to better understand the impact on families and where extra support for working parents could ease family burden.

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What is the Impact of Caregiving on Quality of Life for Parents of Children with Juvenile Idiopathic Arthritis: the Ucan Can-Du and Cure International Prospective Study

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Objectives: To describe the care-related quality of life of caregivers of children with juvenile idiopathic arthritis (JIA).
Methods: The Canada-Netherlands Personalized Medicine Network in Childhood Arthritis and Rheumatic Diseases (UCAN CAN-DU) and CURE study captures consecutive caregiver reported data including the standardized instrument CarerQoL questionnaire. The cohort includes all subtypes of JIA, and patients across the disease trajectory from new diagnosis to starting or stopping biologics. The analytic sample included all patients with a completed CarerQOL measure at baseline. Data collected included demographics, and a standardized measure of caregiving impact, the CarerQol instrument, and questions about paid/unpaid caregiving help. The CarerQol has 6 domains (problems with physical health, mental health, daily activities, relational, financial, and caregiving fulfillment and caregiving support) and can be summarized with a utility score from 0-100 with higher numbers indicating higher impact. Descriptive analyses were performed using RStudio.
Results: Among 498 participants, 282 (56.5%) were from the Netherlands, and 418 (83.9%) were mothers with median age of 42 years [IQR: 36.0 - 46.0]. Most caregivers (n=427, 85.7%)

lived with a spouse/partner, and 430 (86.3%) had either university or technical/college education. In terms of employment, 200 (40.8%) worked full-time, and 195 (39.8%) part-time, while 350 (70.4%) of spouses/partners worked full-time. Physical health conditions were reported by 349 (51%) caregivers, and 110 (16%) had mental health conditions. For spouses, 211 (36%) had physical health conditions, and 48 (8%) had mental health conditions. The mean CarerQoL utility score was 81.5 (SD: 11.1), with a median of 84.2 [IQR: 77.1 - 88.2]. In terms of domains, physical health problems were the most common (43.8%), followed by mental health problems (41.8%) and daily activity problems (41.3%). Financial problems (13.2%) and relational problems (16.9%) were less commonly reported. Conversely, 92.4% felt some or a lot of fulfillment, and 80.3% felt they had caregiving support. Other questions examined unpaid and paid help. There, 20.1% of caregivers reported receiving unpaid help from family, friends, or neighbors in the last three months (median 15 hours, [IQR: 5 - 26.2]), 3.8% received paid help with childcare (median 16 hours, [IQR: 5 - 38.5), and 17 (3.4%) received paid help with household tasks (median 12 hours, [IQR: 4 – 20].
Conclusion: The study highlights the caregiving impact experienced by caregivers of children with JIA. Despite high levels of fulfillment and support, a substantial proportion reported unmet needs. These findings underscore the importance of targeted interventions to support caregivers.

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Health Care Utilization and Cost of Herpes Zoster Infection in Patients With Rheumatoid Arthritis, a Retrospective Cohort Study

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Objectives: Patients with rheumatoid arthritis (RA) have approximately a twofold increased risk of developing herpes zoster (HZ) compared to the general population. This elevated risk is attributed to the disease itself and related. We aimed to measure health care utilization (HCU) and related costs of HZ infections among RA patients from the health care payer perspective.
Methods: Patients with RA were identified from the Ontario Rheumatoid Arthritis Database (ORAD), housed at ICES. Costs were measured from a single universal payer (Ontario Health Insurance Plan). We included all adult patients diagnosed with HZ between 2008 and 2020. A cohort was identified and included all Ontario RA patients that were not diagnosed with HZ during the same period of time. The two cohorts were matched based on sex, date of birth (+/- 3 years) and index date (+/- 60 days of HZ infection). The primary outcome was total HCU cost (in Canadian Dollars) per year, up to 10 years of follow-up (adjusted for 2022 inflation). We also looked at the total number of clinical events (CEs) including the number of hospital admissions, emergency department visits, physician visits and other HCU. The two cohorts were compared using unadjusted gamma distribution models to assess HCU costs, and unadjusted generalized estimating equations (GEEs) with negative binomial distribution to assess total CEs.
Results: We identified 15,573 RA patients diagnosed with HZ. The same number of RA patients without a HZ diagnosis were matched to this cohort. The RA with HZ cohort had significantly higher total HCU costs across all 10 years of follow-up (except year 2) compared to the RA

without HZ cohort (Figure 1, $p<0.05$). The mean total cost ranged from 13,507 CAD at year 1 to 17,120 CAD at year 10 for the RA with HZ cohort compared to 12,651 to 14,534 CAD in the RA without HZ cohort. Physician billing and inpatient hospital costs were the largest cost drivers for both cohorts. Compared to RA patients with HZ, RA patients without HZ experienced a significantly lower mean number of total CEs ($p<0.05$). This difference was the highest one year following a HZ infection.Physician visits were the main driver for total CEs.
Conclusion: We found that HCU costs and total CEs were higher in RA patients with HZ compared to RA patients without HZ. Thus, rheumatologists should consider treatment strategies that minimize the risk of HZ and ensure patients' vaccinations are up to date.

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What Characteristics Are Needed for Optimal Team-Based Rheumatology Care? a Qualitative Study Exploring the Experiences and Perceptions of Rheumatology Health Professionals

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Objectives: The growth of the rheumatology workforce has been insufficient to meet the rising prevalence of rheumatic and musculoskeletal diseases (RMDs) and its increasingly complex management. Interdisciplinary teams, comprising health professionals from multiple disciplines with complementary skills [1.], offer promising solutions to rheumatology workforce shortages and enhancing patient-centred care. These team-based models hold potential for improving accessibility, quality, and equity in care for individuals with RMDs [2.]; however, there remains a limited understanding of the optimal composition and structure of such teams. This study aimed to explore program and health professional characteristics that interdisciplinary health professionals (IHPs) perceived were necessary for optimal team-based care, informed by their experience practising within a rheumatology team.
Methods: This was a qualitative descriptive study. We conducted a secondary analysis of semi-structured interviews with 11 IHPs and rheumatologists with experience working in an interdisciplinary rheumatology team in Ontario (Centre of Arthritis Excellence). Interviews were completed as part of an implementation research case study where participants were asked about their experiences working within an interdisciplinary team, and their perceptions of the factors necessary for optimal team function and for implementing this model of care at new sites. Interview transcripts were inductively coded (initially in duplicate) and thematically analysed. Our multidisciplinary analytic team provided their diverse perspectives and ensured rigour by maintaining an interrogative approach to the data and keeping an audit trail.
Results: We constructed three themes: (1) Importance of program infrastructure; (2) Key IHP qualities (subthemes: rheumatology preparedness and the team player); and (3) Synergy of complementary skillsets. [Figure 1] Participants emphasised the importance of sufficient infrastructure to support team functioning, particularly through shared workspaces, integrated electronic medical records, and competitive compensation. Rheumatology-specific training and

experience were seen as critical to fully participate in interdisciplinary care. Team-members' attitudes, such as prioritising trust, adaptability, and openness to feedback, were seen as crucial for effective teamwork. Participants also saw the value of using their complementary skillsets to enhance both patient care (perception of better clinical outcomes, higher care satisfaction, improved patient experience) and their own professional well-being. This synergy, in turn, fostered ongoing motivation for skill and attribute development among team members.
Conclusion: IHPs working within a rheumatology team viewed this model as beneficial for both patients and health professionals. Our findings suggest that providing IHPs with rheumatology-specific training, the appropriate clinic infrastructure, and having certain personal attributes could optimise team functioning and improve integrated care for RMDs.

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"It's like a One-Stop-Shop": A Qualitative Study Exploring Patient Experiences in Receiving Interdisciplinary Team-Based Care for Rheumatic and Musculoskeletal Diseases

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Objectives: Given the rising prevalence and management complexity of rheumatic and musculoskeletal diseases (RMDs), evidence-informed solutions are needed to provide high-quality care within the available workforce. Interdisciplinary team-based models of rheumatology care, defined as a rheumatologist and one or more interdisciplinary health professionals (e.g., physical therapists, occupational therapists, nurses) working collaboratively to deliver care, provide a promising solution, however there is limited understanding of patients' experiences with this approach. We aimed to 1) explore the experiences of patients living with RMDs receiving interdisciplinary team-based care, and 2) understand patients' perceptions of how team-based care impacts their rheumatic disease management.
Methods: Informed by qualitative description, this study was a secondary analysis of qualitative interviews collected as part of an implementation science case study of the Center of Arthritis Research Excellence (CArE), an interdisciplinary rheumatology care model in Newmarket, Ontario, Canada. Participants were purposively sampled for diversity in age, disease duration, gender, and geographic location. Interviews, lasting 45-60 minutes, included questions pertaining to patients' experiences with team-based care and perceptions of impact on disease management. We inductively coded interview transcripts and constructed themes using thematic analysis.
Results: Fifteen participants were interviewed, 47% identified as female. Ten (67%) had inflammatory arthritis, three (20%) had other inflammatory rheumatic disease, and two (13%) had osteoarthritis. We constructed two overarching themes: 1) Improved Access to Care and 2) Comprehensive Care. Participants described how an interdisciplinary rheumatology team resulted in improved access to diverse healthcare expertise, enhancing overall care efficiency. Team-based care led to quicker responses from interdisciplinary providers compared to traditional practices, according to participants. They perceived that a team-based model resulted in a holistic approach to care, addressing needs beyond what rheumatologists alone could offer. Extended consultations facilitated in-depth assessments, education, and support across all aspects

of disease management. Participants appreciated the integrated "one-stop-shop" model, which minimized external referrals and reduced the number of appointments. The interdisciplinary approach fostered patient engagement, self-advocacy, and shared decision-making.
Conclusion: This study highlights the experiences of patients living with RMDs receiving care within an interdisciplinary team-based model of rheumatology care. A team-based approach was valued by patients for improving care access and providing comprehensive management through complementary expertise, resulting in greater efficiency and holistic management of their RMDs. These results support the increased use of interdisciplinary team-based models in rheumatology care. Future studies should explore patient experiences with team-based care across different sites and team structures.

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Identifying Support Needs of Families Navigating Childhood Rheumatic Disease in Rural and Remote Regions of Northern British Columbia

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Objectives: To identify barriers and facilitators to receiving pediatric rheumatology care for families navigating Juvenile Idiopathic Arthritis (JIA) and other childhood rheumatic diseases (CRD) in Northern British Columbia (BC).
Methods: Parents/Caregivers of children with CRD living in Northern BC and receiving care at the two BC Children's Hospital Rheumatology Outreach clinics located in Prince George and Terrace BC were invited to participate in an online survey and a subsequent semi-structured interview. Survey and interview questions focused on health needs and gaps relating to rheumatology care and were developed based on previous community engagement work in these clinics. Through in vivo coding, data was thematically analyzed and summarized into actionable themes.
Results: Nine families completed the survey and two families participated in the interviews. Their children had a median age of 6 y. Distance to the rheumatology outreach clinic varied, with 45% of participants (n = 4) reported travelling less than 10 km, 10% (n = 1) travelling between 100 km - 200 km, and 45% of respondents (n = 4) travelling more than 200 km. 70% of participants (n = 7) described: feeling that their child's symptoms were initially dismissed by local health care providers, feeling that their child did not receive adequate medical attention from their general practitioners, feeling that their family's case was overlooked multiple times, and ultimately resorting to emergency care. Helpful supports identified by participants following their child's diagnosis included: 50% (n = 5) affirming that connection with other parents and families as helpful and 80% (n = 8) described or recommended examples of self-advocacy to support the journey to diagnosis. The thematic coding resulted in 4 actionable recommendations for the pediatric rheumatology health team and Cassie + Friends to take forward. [Table 1]
Conclusion: Our findings demonstrate the emotional toll that children and families may experience while reaching a diagnosis and navigating CRD when living in Northern and rural BC. Connections to other local families, and encouragement for parental advocacy, were highlighted as positive actions for families. This community-based needs assessment allowed for

the development of actionable solutions including disease-specific education for general practitioners, increased mental health services, regionally accessible supports, and local parent navigators which may promote a greater sense of support and well-being for Northern BC families impacted by CRD.

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Frequency and Impact of Off-Label Biologic Prescriptions in Pediatric Rheumatology

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Objectives: Over the past 25 years, biologic disease-modifying anti-rheumatic drugs (bDMARDs) have dramatically altered pediatric rheumatology practice and treatment outcomes. However, many bDMARDs have no on-label indications for pediatric rheumatological conditions in North America. In clinical practice, this gap creates a significant barrier for care. The objectives of this study wereto 1) assess the frequency of off-label bDMARD prescriptions across pediatric rheumatological conditions in patients followed at the Stollery Children's Hospital and the Glenrose Rehabilitation Hospital in Edmonton, Alberta, and 2) assess the impact label indication has on funding approval.

Methods: A retrospective chart review was conducted on patients with bDMARDs prescriptions at our two outpatient pediatric rheumatology clinics. Charts were identified through a list created by nursing staff of all patients on bMARDs. Patients were included if the bDMARD was started at our clinic for prescriptions between January 2015 to June 2023; there was a pediatric rheumatologic indication, and the patient was ≤18 years old at time of prescription. Duplicates, unfilled prescriptions, and non-bDMARD prescriptions were excluded. We tabulated the Health Canada and the FDA online databases on-label indications of prescribed bDMARDs (as of March 2024). Prescriptions and indication status were reviewed individually by the first and senior author and then reviewed together. Descriptive analysis was done with categorical data summarized as frequencies and percentages and numerical data as means and standard deviations (SD).

Results: 215 charts and 378 prescriptions were included [table 1]. The median age at diagnosis was 8.75 with SD 4.59. Juvenile Idiopathic Arthritis (JIA) was the most common diagnosis (n=158, 73.5%). The most prescribed bDMARDs were adalimumab (n=188, 44.3%), etanercept (n=75, 19.8%) and Tocilizumab (n=35, 9%). Across all included bDMARD prescriptions, 50.5% (n=191) were for use in an off-label indication. 151 patients (70.2%) had no insurance denials for coverage while 64 (29.8%) had ≥ 1 denials.

Conclusion: At our pediatric rheumatology center in Alberta, 50.5% of bDMARD prescriptions were for an off-label indication. 29.8% of our patients had at least one denial of medication coverage. This indicates that this widening gap between clinical and labeling indications in daily

clinical practice may contribute to challenges in patient care. Further analysis is underway to examine the impact of off-label prescriptions on the approval of different funding streams.

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To Biopsy or Not to Biopsy: Imaging Features of Chronic Nonbacterial Osteomyelitis of the Clavicle

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Objectives: Chronic nonbacterial osteomyelitis (CNO) of the clavicle can pose a diagnostic challenge as the differential includes malignancy and infection. Biopsy is often required for unifocal clavicular lesions as CNO is a diagnosis of exclusion. With recent advances in imaging techniques, we aim to describe features on plain radiograph and MRI that may distinguish CNO from other conditions that must be excluded.

Methods: This is a single-centre retrospective chart review of all patients presenting with a unifocal clavicular lesion who underwent a clavicular biopsy and radiographic imaging between the years of 2000-2022. A diagnosis of CNO or non-CNO was extracted from chart review based on histology and the opinion of the treating physician. Imaging (plain radiograph, MRI) was reviewed by two musculoskeletal radiologists blinded to the final diagnosis. Clinical and imaging features were compared between patients diagnosed with CNO and non-CNO diagnoses using Fishers' Exact Test.

Results: 41 patients were included in the analysis: 25 patients with CNO and 16 with non-CNO (diagnoses included: aneurysmal bone cyst (n=5), Langerhans Cell Histiocytosis (n=4), leukemia (n=1), infectious osteomyelitis (n=1), Gorham Stout (n=2), fracture (n=1), fibrous dysplasia (n=1) and 1 diagnosis was unknown). All patients had radiography of the clavicles and 32 patients had MRI. Patients with CNO were more likely to have multifocal lesions on imaging (p=0.01) and were less likely to have fever or weight loss at presentation (p=0.05). CNO lesions on plain film were more likely to be located on the medial clavicle (p=2e-04) with periosteal reaction (p=0.03). On MRI, rhomboid fossa involvement (Fig. 1) was found in 19 of 25 patients with CNO, and 0 of 16 in those with non-CNO (p=4.87e-07).

Conclusion: This study describes a novel association of rhomboid fossa involvement on MRI with CNO that is not present in non-CNO cases. Multifocal lesions on imaging, absence of fever/weight loss, periosteal reaction on plain film and medial clavicular involvement are supportive features of CNO. MRI is an important diagnostic tool and it may be possible to avoid biopsy by using imaging modalities in conjunction with clinical features to make the diagnosis of CNO.

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Optimizing Inpatient Kawasaki Disease Care - a Quality Improvement Project to Reduce

Length of Stay

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Objectives: Kawasaki Disease (KD), an acute pediatric vasculitis, requires timely inpatient management to prevent coronary artery disease. The Hospital for Sick Children (SickKids) sees about 100 cases of KD annually. Hospitalization and lack of reliable educational resources negatively impact the patient and family experience. By eliminating inefficiencies, reducing length of stay (LOS) and improving patient education, we aim to optimize patient experience and conserve healthcare resources. The objective is to optimize inpatient care for uncomplicated KD by reducing LOS by 33% at SickKids by December 2024.

Methods: This is a quality improvement project using the Model for Improvement Framework. The project includes all patients diagnosed and treated at SickKids. Stakeholders include Paediatric Medicine, Rheumatology, KD clinic, Transfusion Medicine and parent representatives. The outcome measure is LOS. Outcome measurement excluded patients with: shock, prolonged antibiotics, IVIG-resistance and coronary artery lesions. Process and balancing measures were collected for all patients. Balancing measures included rate of re-presentation to emergency care, untreated fever and patient satisfaction. Cost savings were estimated by calculating reductions in hours of admission as well as unnecessary bloodwork. Chart review of 26 patients in 2023 demonstrated a baseline average LOS of 56 hours. A new clinical pathway was developed to standardize care and eliminate unnecessary testing. Updated educational materials for caregivers were developed. Patient satisfaction surveys collected anonymous feedback on the inpatient experience as a balancing measure, and were compared to hospital-wide patient satisfaction data.

Results: Thirty-two patients were admitted with KD since implementation of change ideas in December 2023, with outcome measures collected for 15 patients. The average LOS was 48 hours (14% reduction from baseline) (Fig.1). Process measures among 32 patients showed excellent uptake in change ideas following 3 PDSA cycles. Patient satisfaction remained high and there were no increased rates of healthcare utilization or safety issues between discharge and first clinic follow-up. There was an estimated $14,725 in cost savings over 32 admissions.

Conclusion: Although a 14% reduction in LOS did not meet our target, there was a significant downward shift in LOS due to strong uptake of the new KD clinical pathway. Adherence to the KD pathway was achieved through stakeholder engagement, standardization and use of automation. Cost and resource savings were achieved through reduction in LOS and unnecessary laboratory testing. Further data collection is required to demonstrate sustainability; however this project and pathway may be of interest to other institutions that care for patients with KD.

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The Uses and Advances in Imaging for Psoriatic Arthritis: a Scoping Review

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Objectives: Psoriatic arthritis (PsA) is a chronic inflammatory condition characterized by

variable involvement of the skin and musculoskeletal system. It is associated with significant comorbidities leading to disability, poor mental and physical health outcomes, and decreased quality of life [1]. With advances in treatment, early diagnosis has been key in early intervention and stopping disease progression [2]. Our review aims to map the literature on clinical trials with a focus on imaging modalities, advancements in imaging techniques, and identify gaps to propose directions for future research.
Methods: Following the Arksey and O'Malley framework for scoping reviews [3], we conducted a comprehensive search of databases including MEDLINE, Embase, PubMed Central, CINAHL, Academic Search Complete, and ScienceDirect, covering the period from January 1, 2000 to June 27, 2024. After deduplication, title and abstract screening, full-text review, and citation searching, a total of 53 peer-reviewed articles met our inclusion criteria for data extraction and analysis.
Results: Our search captured 1961 articles and after deduplication, title and abstract screening, and full-text review, 53 studies were included for analysis. Radiographs were used in 32/53 studies (60%) and the majority of these were randomized controlled trials (RCTs) (53%). Radiographic progression was most frequently measured with the PsA-modified Sharp/van der Heijde score (69%). Ultrasound (US), which included power doppler US (PD-US) and grey-scale US (GS-US), was used in 11/53 studies (21%) to assess for synovial hypertrophy and inflammation. Though standardized scoring systems such as the GLOESS are available, they were only used in 3/11 studies (27%). Magnetic resonance imaging (MRI) was used in 16/53 (30%) studies and evaluated both peripheral and axial disease in PsA. Validated scoring systems such as PsAMRIS and SPARCC are becoming widely adopted in more recent trials. Dynamic contrast enhanced MRI (DCE-MRI) was also compared to computed tomography (CT) and demonstrated high sensitivity for bone erosions and inflammation. Multimodal imaging was used in 7/53 studies (13%) and CT was only used in 2/53 (4%).
Conclusion: The development of PsA-specific scoring systems for X-ray and MRI has been instrumental in advancing imaging assessment in PsA. However, their application remains limited, particularly in ultrasound, where further standardization is needed. Future clinical trials should focus on increasing the adoption of PsA-specific scoring systems across modalities, exploring novel imaging techniques such as DCE-MRI, and using multi-modal imaging to improve disease monitoring in PsA.

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Retrospective Comparative Analysis of Diagnostic Tools for Giant Cell Arteritis

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Objectives: To assess the diagnostic performance of various giant cell arteritis (GCA) diagnostic tools including temporal artery biopsy (TAB), which is the current gold standard for GCA diagnosis, temporal artery ultrasound (US), presence of concurrent polymyalgia rheumatica (PMR) and the American College of Rheumatology (ACR) criteria for GCA diagnosis.
Methods: A retrospective chart review was conducted on 138 GCA cases between 2006-2024

where one or more GCA diagnostic tests were conducted. True positives (TP), true negatives (TN), false positives (FP), and false negatives (FN) were determined using the final clinical diagnoses and were used to calculate sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy. Relative risks (RR) of PMR history and PMR symptoms at presentation for GCA diagnosis were also calculated.
Results: TAB showed an accuracy of 0.722, a sensitivity of 0.449 and a specificity of 1 (n=97). There was no significant difference in diagnostic accuracy of TAB when the biopsy specimen was greater than 1cm compared to when it was less than 1cm (p=0.262). US showed an accuracy of 0.834, a sensitivity of 0.636 and a specificity of 0.95 (n=31). RR of GCA diagnosis in patients with a history of PMR was 1.36 and in patients presenting with both GCA and PMR symptoms was 1.48 (n=136). ACR criteria showed an accuracy of 0.553, a sensitivity of 0.744 and a specificity of 0.609 (n=85).
Conclusion: The results of our study support that TAB may have great specificity but low sensitivity in diagnosis of GCA. We also found that US may have similar diagnostic performance to TAB in diagnosing GCA, indicating its utility as an effective non-invasive diagnostic tool. Our findings also indicate a lower sensitivity and specificity for the ACR criteria compared to previous studies. Additionally, the relative risk analysis underscores the increased likelihood of GCA diagnosis in patients with a history of PMR or presenting with concurrent PMR symptoms. Given the variability introduced by smaller sample sizes, this study should be considered a preliminary investigation into the clinical utility of these diagnostic tools. Future research with larger sample sizes is essential to validate these results and to better define the interplay of TAB, US, ACR criteria and PMR history in GCA diagnosis. This will help determine the optimal diagnostic approach and whether alternative tests might effectively supplement or replace TAB in clinical practice.

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To Tap or Not to Tap: Safely Investigating Monoarthritis of the Knee in Children in a Lyme Endemic Region

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Objectives: Differentiating Lyme arthritis (LA) from septic arthritis (SA), an orthopedic emergency, can be a diagnostic challenge. Arthrocentesis is often part of the work-up in this setting [1]. A prospective study of >500 children presenting to emergency departments (EDs) with knee monoarthritis in a Lyme endemic area in the US found that a 2-factor prediction rule [absolute neutrophil count (ANC) < 10 000 cells/mm3 and ESR < 40 mm/hr) accurately identified children at low risk for SA [2]. Our objectives were to determine (1) the setting in which children with LA first present to care (2) the rate of arthrocentesis in the diagnostic work-up of children with LA, and (3) in those presenting with knee monoarthritis, the proportion who would meet the criteria for low risk of SA.
Methods: Children with LA seen in pediatric rheumatology clinic at the IWK Health Centre in Halifax, NS (January 2008-June 2023) were identified from a clinical database. Medical record review was conducted to extract demographic, clinical, and laboratory variables relating to the

initial point of presentation to care for LA. Descriptive statistics are reported.
Results: 230 children with LA were identified. 72% were seen in EDs with the remainder seen in office settings, primarily by family doctors. 72% presented with monoarthritis of the knee, 6% with monoarthritis of another joint, and 22% with arthritis in > 1 joint. 26% of children were febrile on presentation/had a history of fever and 46% had a history of episodic arthritis. 78/230 (34%) had an arthrocentesis performed with a median synovial fluid WBC of 57,730 x 106/L (range 6,908-97,550). 68/78 (87%) who underwent arthrocentesis presented with monoarthritis of the knee. Of these 49 (72%) had an ESR performed (median 39, range 5-78, <40 in 25) and 67 (99%) had an ANC performed (median 5.3, range 0.6-13.2, <10 in 66). 48/68 (71%) had both the ESR and ANC performed; of these 24 (50%) met the criteria for low risk of SA.
Conclusion: Approximately three quarters of children with LA initially presented to EDs, typically with monoarthritis of the knee. When applying the prediction rule to those with sufficient data, we found that half of children would have been classified as low risk of SA raising the possibility that arthrocentesis, an invasive procedure in children, could have been safely avoided. The next phase of this work will be to further investigate factors associated with arthrocentesis in this cohort.

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Joint Recruitment – a Phenomenon of New Onset Arthritis Following Initiation of Antibiotic Treatment for Lyme Arthritis

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Objectives: Lyme arthritis (LA), a manifestation of late disseminated Lyme disease (LD), is a common presentation of LD in children [1]. A complete response to 1-2 courses of antibiotics occurs in most patients; however, 10-15% can have persistent arthritis in the presenting joint(s), termed post-infectious LA [2]. Another phenomenon, which has been called "joint recruitment," describes new onset arthritis in a joint(s) after antibiotic therapy has been initiated or completed [3]. The objectives of this study were to describe the incidence and clinical course of joint recruitment in a cohort of children with LA.
Methods: Patients (<18 yo) with a diagnosis of LA (Jan 2008-Sept 2023) were identified from the pediatric rheumatology clinical database at IWK Health in Halifax, Nova Scotia. Medical charts were reviewed and those who experienced new onset arthritis beyond the presenting joint(s), following initiation of antibiotic therapy, were identified. Descriptive statistics are described.
Results: Of 245 patients, the incidence of joint recruitment was 5.7%; 9 males/5 females with a mean age of 11.9 years (range 4-16). All patients were initially treated with a standard course of 28 days of oral antibiotics. In 13/14 (93%) a single knee was the presenting joint. In 11/14 cases (79%), one joint was recruited (6 knee, 3 elbow, 1 wrist, 1 shoulder). Timeline varied from within a few days of starting the first course of antibiotics to following 2 months of oral and/or IV antibiotics [Figure 1]. When joint recruitment occurred, the presenting joint with arthritis had resolved or improved in 9/14 (64%). 8/14 (57%) received another course of antibiotics at the time of joint recruitment; treatment for the remainder was variable (intraarticular steroid injection (IAS), NSAID, observation, synovectomy). All patients had complete resolution of

their LA at last follow-up, except for one patient who, 6 months from initiation of antibiotics, continues to have ongoing arthritis in both the presenting joint and recruited joint following 3 months of antibiotics (2 courses oral, 1 course ceftriaxone) and IAS of affected joints (knee, ankle).
Conclusion: The study aims to raise awareness around atypical cases of LA in children. To our knowledge, this is the first study to report the incidence (5.7%) of joint recruitment. Overall, patients had excellent outcomes despite different treatment approaches. It is unclear as to whether joint recruitment is driven by persistent active infection versus immune dysregulation triggered by infection, the latter hypothesized to be the underlying mechanism of post-infectious LA [2].

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Insights into Insurance for Vaccine Coverage Patients on Specialty Medications

Abdullahi Mohamed (University of Alberta, Edmonton); Stephen Williams (Cumming School of Medicine, Calgary); Aurore Fifi-Mah (University of Calgary, Calgary)

Objectives: There is a growing usage of biologics and targeted synthetic disease modifying antirheumatic drugs (tsDMARDs) for the management of inflammatory arthritis. These medications, while effective at managing rheumatic disease, may also increase the risk of vaccine preventable illnesses such as influenza, COVID-19, pneumonia, and shingles.] The vaccination rate in the general population is low. We wanted to evaluate the rate of vaccination of patients with inflammatory arthritis seen in our clinic and identify barriers to immunization. Here we focused on type of insurance coverage for vaccines.
Methods: Vaccination and insurance information of patients seen at the South Health Campus Rheumatology Clinic was collected and analyzed from the period of January 1, 2023 to January 1, 2024 . All patients in this study were aged 18 or older, had a diagnosis of inflammatory arthritis, were on a biologic or a tsDMARD, and had some form of insurance. Patients were allocated into groups based on insurance type (Public/Government, Private, and Two Insurances). Descriptive statistics were used for data analysis.
Results: 216 patient charts were reviewed (see Table 1). Full vaccination in the public insurance group were as follows: Influenza (81/132, 61.4%), COVID-19 (99/132, 75.0%), Prevnar 13 or 20 (75/132, 56.8%), Pneumovax 23 (106/132, 80.3%), and Shingrix (41/132, 31.1%). Full vaccination in private insurance group were as follows: Influenza (50/103, 48.5%), COVID-19 (74/103, 71.8.0%), Prevnar 13 or 20 (59/103, 57.3), Pneumovax 23 (59/103, 57.3), and Shingrix (34/103, 33.0%)
Conclusion: Overall, there were several important findings. The group with the highest vaccination rate across all categories were those possessing two or more insurance plans. Higher rates of influenza and Pneumovax 23 vaccination were seen in the public insurance group, but this is likely due to a majority of this group being older than 65 (age required for free Pneumovax coverage) and the general trend of increased influenza vaccination in older adults.[2] Prevnar and Shingrix vaccination rates were seemingly similar for public and private groups, however sub-group analysis presented an important finding. Patients possessing employer insurance had higher vaccination rates (Prevnar 13/20-68%, Shingrix-46%) than any other private or public insurance sub-group. The difference in vaccination rate is likely due to improved vaccine cost coverage, increased formulary size, and health spending accounts

associated with these plans. This information will help us advocate for publicly provided coverage for other essential vaccine such as Shingrix (as of July 2024, Prevnar 20 is publicly funded in Alberta).

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A Clinical Audit of Vaccination in Patients Living with Inflammatory Arthritis and Receiving Specialty Medications

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Objectives: Both ACR and EULAR recommend appropriate vaccination for patients with inflammatory arthritis due to their higher risk of vaccine-preventable illness (VPI).[1,2] Immunosuppressive therapies may further increase VPI risk. Understanding baseline vaccination rates is crucial for implementing targeted quality improvement strategies.

Methods: A chart review was performed on South Health Campus Rheumatology Clinic patients who were a) seen between January 1, 2023 and January 1, 2024, b) over the age of 18, c) diagnosed with inflammatory arthritis (RA, PsA, AS, SpA, etc.), and d) were taking either biologic or JAK inhibitor pharmacotherapy. Vaccinations against influenza, COVID-19, pneumonia (Prevnar 13/20, Pneumovax-23), and shingles (Shingrix) were reviewed. Both physician and stable nurse clinics patients were included. Descriptive statistics were perrformed for data analysis.

Results: 216 patient charts were audited (Figure1). We found that 97% (210/216) of patients had a recommendation for updating or achieving full vaccination noted in their rheumatology consult notes. 53.2% of patients (115/216) received annual influenza vaccine, with 66.6% (64/96) in nurse clinics vs. 42.5% (51/120) in physician clinics. 64.6% (73/113) of patients >65 received this vaccination c.f. 40.6% (41/101) <65. 69.9% of patients received > 3 mRNA COVID vaccines with 79.2% (76/96) of vaccinations in nurse clinics vs. 42.5% (75/120) in physician clinics. 84.1% (95/113) of patients age >65 received vaccination c.f. 54.4% (55/101) <65. 55.5% of patients received Prevnar 13 or 20: 68.7% (66/96) in nurse clinics vs. 45% (54/120) in physician clinics. 63.7% (72/113) of patients age >65 received vaccination c.f. 45.5% (46/101) of patients <65. 68.5% of patients received Pneumovax-23: 81.2% (78/96) in nurse clinics vs. 58.3% (70/120) in physician clinics. 89.4% (72/113) of patients age >65 received vaccination c.f. 45.5% (46/101) <65. 28.7% of patients received Shingrix: 36.4% (35/96) in nurse clinics vs. 17.5% (27/120) in physician clinics. 35.4% (40/113) of patients >age 65 received vaccination c.f. 21.8% (22/101) of patients <65.

Conclusion: In this audit we found increased vaccination rates in the nurse clinic and among patients > 65 years old. High vaccination rates observed in the nurse clinic likely resulted from dedicated preventative health protocols, clinical stability of nurse clinic patients, and physician/nursing collaboration. Higher rates of >65 vaccination were likely due to increased vaccine receptiveness of older adults, public coverage and outreach programs (programs focusing on vaccination for patients in congregate living), clinic promotion efforts, and community (family physician, pharmacy) promotion of vaccination.

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Severe Disabling Muscle Involvement as an Initial Presentation of Childhood Polyarteritis Nodosa - a Multi-Center Case Series

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Objectives: Muscular polyarteritis nodosa (PAN), a disease that is predominantly confined to the skeletal muscle, has barely been described in adult literature and has been exceedingly rarely reported in children. The clinical presentation is non-specific, and the diagnosis is challenging and often delayed, requiring imaging evaluation and histopathological confirmation.[1] We aimed to describe the clinical presentation, complimentary workup, treatments given, and the outcome of this rare entity in a pediatric case series, underscoring the role of imaging evaluation in aiding the diagnosis.

Methods: A search of medical databases in four pediatric rheumatology referral centers identified four patients diagnosed with muscular PAN between 2015 and 2023. Clinical presentation and laboratory workup data, including genetics, imaging, histopathology, detailed follow-up, and treatment outcomes, were collected retrospectively and prospectively. Diagnosis required meeting the EULAR/PRINTO/PRES childhood-PAN criteria, with no findings suggesting major extra muscular, visceral involvement.

Results: Four pediatric patients (two Females and two Males), aged 8.5 to 15 years at presentation, were enrolled. All presented with severe disabling muscular pain, ill appearance, arthralgia, preserved muscle power, normal muscle enzymes, and elevated inflammatory markers. Three of them also had a fever when presented. MRI of the limbs revealed hyperintense signaling and edema of the affected muscles in cases 1,2,4, whereas PET-CT done in cases 1,2,3 showed increased uptake in the involved muscles, indicating myositis. Case 1,2,4 had skin and muscle biopsies with features compatible with PAN, while case 3 had PAN-supportive skin biopsy. All had initial proper responses to corticosteroids and immunosuppressants (Methotrexate or Azathioprine), but three of them experienced recurrent relapses necessitating prolonged therapy. None of the patients have developed visceral involvement or evolved to systemic PAN.

Conclusion: Pediatric practitioners should remain vigilant for the rare muscular-predominant PAN. Early recognition and diagnosis, aided by imaging tests such as MRI and occasionally PET-CT, along with histologic confirmation, are essential for prompt management and improved outcomes.

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Chronic Non-Infectious Osteomyelitis of the Petrous Bone: A Case Series

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Objectives: Chronic Nonbacterial Osteomyelitis (CNO) is an autoinflammatory disorder of bone typically beginning children between the ages of 7-12. Any bone can be affected, involvement of the skull is unusual and petrous bone involvement has not been reported. The objective of our study is to illustrate presenting features associated with CNO of the petrous temporal bone, its treatment, and response to therapy. The second is to increase awareness that CNO can involve the petrous temporal bone with the hope it will aid in diagnostic clarity for challenging cases.

Methods: Cases of patients diagnosed with CNO between June 2002-May 2022 at The Hospital for Sick Children were identified by searching Bialogics and the Electronic Medical Record Epic. Charts were searched for the term “skull” to identify cases affecting the skull. To obtain records prior to 2018 we ran a word search of pertinent synonyms to identify cases of CNO involving the temporal bone in the ISYS imagining system. Research Ethics Board approval was obtained.

Results: Three cases of CNO affecting the petrous temporal bone, were identified. All had known CNO peripheral lesions. They ranged in age from 2-10 years old and were female. Two patients had 7th cranial nerve involvement and hearing loss. All patients were treated with a non-steroidal anti-inflammatory drug (NSAID) and two patients with hearing loss received anti-TNF therapy (adalimumab) and responded well with resolution of hearing loss in one case and residual mild to moderate conductive hearing loss in another. These cases are unique as they involve the skull, a less affected CNO site.(1,2) It typically affects metaphysis and epiphyses of the long bones, vertebral bodies, and the clavicle. Axial skeletal involvement is less prevalent (61%) compared to appendicular skeleton involvement (75%).(2) With 1% of patients presenting with skull lesions (Image 1).(2) It is unknown why CNO rarely affects the skull. Theories include CNO tends to affect the metaphysis and epiphyses of the long bones which the skull does not have. Another is there is increased metabolic activity at the epiphysis with chondrocyte maturation which could result in increased propensity of immune dysregulation and inflammatory lesions.(3)

Conclusion: CNO typically affects the metaphysis of the long bone but can affect any bone in the body, including the temporal petrous bone of the skull. It is important to consider CNO on the differential in patients who present with cranial nerve abnormalities, facial nerve palsy, hearing loss, and those with presumed infectious osteomyelitis.

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Neurological Behcet’s Disease in an Adolescent: A Case Report

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We present a case of a 14-year-old Somali male with a history of latent Tuberculosis (TB) who presented with two episodes of conjunctivitis and left eye blurred vision. He was diagnosed with bilateral pan uveitis and right cystoid macular edema. Work-up demonstrated positive HLA-B51 and Toxoplasmosis IgG antibody and he was started on sulfamethoxazole and trimethoprim. Previous TB QuantiFERON was positive with negative chest x-ray and TB skin test.

Three months later, he presented with acute genital ulcers, lower extremity paresthesia, back pain, urinary retention, headache, and photophobia. The family mentioned he had recurrent episodes of oral ulcers for a year which was not revealed during earlier assessment despite questioning, although there was a language barrier. On exam, there was loss of sensation to bilateral legs with left foot clonus, hyperreflexia bilaterally, and punctate ulcerations to the scrotum. He had acute altered level of consciousness, apnea, and a paroxysmal event thought to be a seizure treated with lorazepam and required intubation.

Cerebral Spinal Fluid (CSF) showed elevated protein and white blood cell count. CSF, blood, and urine cultures were negative. Magnetic Resonance Imaging (MRI) of the brain demonstrated abnormal restricted diffusion with associated T2/FLAIR hyperintensity to bilateral hippocampi and left greater than right mesial temporal lobes with patchy enhancement on post-gadolinium images (Figures 1-3). There was no leptomeningeal or pachymeningeal enhancement. Spine MRI demonstrated patchy long segment T2 signal abnormality of the central spinal cord (greater than 2/3 of the area from C7-L5 and from L5-T10) with minimal cord expansion, and patchy enhancement at T6 (Figures 4 and 5). Findings raised the possibility of atypical non-herpetic viral encephalitis versus transverse myelitis, the images did not have a typical appearance for Behcet's disease.

Given the clinical features, radiographic findings, and HLA-B51 positivity, he was diagnosed with Neurological Behcet's (NB). Given the seizure, he was started on Levetiracetam for a 6-month course. He had significant neuropathic pain, and was treated with pregabalin and a ketamine infusion, which was eventually discontinued. He received IV methylprednisolone, infliximab, and transitioned to oral steroids.

Prophylactic sulfamethoxazole and trimethoprim were continued given the history of toxoplasmosis. He did not require prophylaxis for TB. He was transferred to a rehabilitation hospital for ongoing rehabilitation and subsequently discharged home. Repeat imagining demonstrated resolution of the lesions after treatment. Informed written consent for this case report was obtained.

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"I was Just so Concerned that this was Going to be a Lifetime of Problems for Him": Caregiver Experience of Children Diagnosed with Lyme Arthritis in Nova Scotia

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Objectives: Nova Scotia (NS) has the highest incidence of Lyme disease (LD) in Canada [1]. The pediatric rheumatology clinic in Halifax, NS, has seen a significant increase in the number of referrals for Lyme arthritis (LA) over the past decade. There exist unanswered questions and controversies related to LD, including the link between long-term chronic symptoms and LD, primarily described in the adult literature [2]. Our objective was to explore the perceptions of caregivers of children diagnosed with LA regarding knowledge about LD prior to diagnosis, views on the care provided, and attitudes towards their child's ongoing health in relation to the LD diagnosis.
Methods: Methods: Patients diagnosed with LA between January 1 to December 31, 2022 were identified from a tertiary care pediatric rheumatology clinic in Halifax, NS. Purposive sampling was conducted based on the age of the child, clinical course, and health zone of residence. Parents were invited to participate in the study via a letter. Telephone interviews, using a semi-structured interview guide, were recorded and transcribed. Themes were abstracted from transcripts using an open coding and general inductive approach.
Results: Results: 14 interviews (10 mothers, 4 fathers) were completed [median age of child 8.5 (range 3-14)]. Eight patients had resolution of LA following the first course of antibiotics and 6 required further treatment to reach symptom resolution. All 4 NS health zones were represented. Five themes were identified (selected quotes are presented in Table 1): (1) Pre-existing negative perceptions. Caregivers had negative connotations informed by learning of experiences of acquaintances and celebrities with LD. (2) Lack of awareness about LD presentation in children. Caregivers were not aware that arthritis is a manifestation of LD or that a bullseye rash may not be present. (3) Need for reassurance. Caregivers were relieved when referred to a specialist and took comfort in having the chance to ask questions and be given a clear treatment plan. (4) Emotional impact. Caregivers experienced persistent guilt (e.g. they should have prevented the infection) and fear about reinfection. (5) Responsibility to spread awareness. Caregivers felt the need to share their knowledge and experience in their communities around the symptoms and presentation of LD in children.
Conclusion: Conclusion: Healthcare providers have an opportunity to anticipate caregivers' perceptions of LD and provide evidence-based education and reassurance. Despite the high incidence of LD in NS, there is a need to improve public knowledge about manifestations of LD in children, particularly LA.

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The Incidence Rate and Risk Factors of Arrhythmias in Patients with Psoriatic Arthritis

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College Research Institute and Division of Rheumatology, University of Toronto, Toronto)
Objectives: To estimate the cumulative incidence rates (CIRs) and risk factors for cardiac tachy- and bradyarrhythmias in patients with psoriatic arthritis (PsA).
Methods: We performed an analyses of the University of Toronto PsA prospective cohort from its inception in 1978 to April 2024. Patients were assessed every 6 to 12 months following a standard protocol where demographic, clinical, comorbidity and medication data were collected. Arrhythmia events were identified via record linkage with provincial hospitalization databases and review of medical records by physicians. Arrhythmia endpoints were classified as atrial (defined as atrial fibrillation, flutter or supraventricular tachycardia), ventricular (defined as ventricular tachycardia, fibrillation or placement of cardiac resynchronization therapy with a defibrillator) and bradyarrhythmias (defined as second- or third-degree atrioventricular block or placement of pacemaker). Cox proportional hazard regression models were used to evaluate the association between PsA measures of disease activity (measured as time-varying (TV) or cumulative average (CA)) and each arrhythmia endpoint separately. Each model was hierarchically adjusted for potential confounders as follows: Model 1: adjusted for age and sex, model 2: also adjusted for cardiovascular risk factors, and model 3: added information on PsA therapies.
Results: Of 1670 PsA patients (mean age 46.35 years, 54.2% male) included in this analysis, a total of 80 atrial, 17 brady and 11 ventricular arrhythmias were identified. By 70 years of age, the overall CIRs were 0.08 (95% confidence interval (CI) 0.06-0.10), 0.01 (95%CI 0.00-0.01) and 0 (95%CI 0.00-0.01) for atrial, ventricular and bradyarrhythmias, respectively. In the fully adjusted multivariable model (Model 3, Table 1), higher disease activity index for PsA (DAPSA) was associated with higher risk of atrial arrhythmia. The following variables were significantly associated with higher risk of atrial arrhythmia: higher DAPSA score, hazard ratio (HR) - 1.15, 95%CI (1.03-1.29) was associated with a 10-unit higher value for CA covariate; and higher 3-visual analogue scale (3-VAS) with HR of 1.18, 95%CI (1.04-1.33) for TV and 1.22, 95%CI (1.04-1.44) for CA covariates. On the other hand, remission/low vs. high disease activity measured by DAPSA with HR of 0.49, 95%CI (0.26-0.92) for TV and 0.46, 95%CI (0.23-0.91) for CA covariates were significantly associated with lower risk of atrial arrhythmia.
Conclusion: Higher burden of disease activity in PsA is associated with higher atrial arrhythmia risk. These findings reinforce the importance of controlling inflammation in PsA to optimize cardiac health.

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Identification of Psoriatic Arthritis-Related Pathways Using Multi-Omics Data Integration
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Objectives: The objectives of this study include (i) identifying and curating publicly available omics studies on psoriatic disease (PsD) to build a multi-omics data integration portal (PsDIP) and (ii) integrating studies from PsDIP comparing the serum omics profiles of psoriatic arthritis (PsA) and cutaneous psoriasis (PsC) patients to identify PsA-related pathways.
Methods: A scoping review was conducted to curate all publicly available omics studies in the field of PsD from three databases: Ovid Medline, Embase and Cochrane Central. Inclusion criteria comprise all English language studies related to psoriasis, PsA and PsC investigating markers/molecular signatures in human subjects using non-targeted high throughput experiments. Lists of differentially expressed markers, study and clinical information were extracted from all papers that passed the eligibility criteria, to develop a multi-omics data integration portal for PsD (PsDIP). To demonstrate the usability of this portal in identifying novel PsA-related pathways, we conducted a preliminary integrative analysis. Lists of differentially expressed proteins, microRNAs (miRNAs) and metabolites from three independent single omics studies comparing serum samples of PsA and PsC patients were collected from PsDIP. All differentially expressed markers were integrated using the following bioinformatics tools: mirDIP (miRNA Data Integration Portal) v5.2, IID (Integrated Interactions Database) ver. 2021-05, STITCH (Search Tool for Interacting Chemicals) v5, pathDIP (Pathway Data Integration Portal) v5, and NAViGaTOR (Network Analysis, Visualization, & Graphing TORonto) v3. Single omics markers (proteins, metabolites and miRNAs) were connected via a network of biological interactions and overlapping pathways.
Results: 5 miRNAs, 34 proteins and 19 metabolites differentially expressed between PsA and PsC were derived from the three independent studies selected. 71 target genes of the 5 miRNAs were found to be connected with 10 proteins and 19 gene interactors of 3 metabolites via protein-protein interactions and 71 statistically significant pathways ($q<0.05$) were found to be common among them. 39 are found to be relevant to PsA from literature. 25 of the 39 pathways are potentially important pathways for PsA not identified by the PsA single omics studies in PsDIP such as RANKL, oncostatin M, HIF-1, PDGFR-beta, M-CSF, IL-7, and IL-18 signaling pathways (Figure 1).
Conclusion: Multi-omics integration of independent single omics serum datasets identified key pathways related to osteoclastogenesis, angiogenesis and inflammation which are important to PsA pathophysiology. Genes and proteins associated with these pathways are candidate differentially expressed molecules between PsA and PsC. Further analyses and validation are ongoing.

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Thirsty Eyes: A Look at Dry Eyes in Autoimmune/inflammatory Syndrome Induced by Adjuvants (Asia; Shoenfeld's Syndrome)

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Objectives: Many patients with autoimmune syndrome induced by adjuvants (ASIA) due to silicone breast implants complain of dry eyes, which may be due to impaired tear production or increased tear evaporation. The clinical differences between ASIA patients with dry eyes, compared to other rheumatic diseases (e.g. Sjogren's syndrome) are largely unknown.
Methods: We utilized a cross-sectional design to enroll 78 consecutive patients with ASIA due to breast implants, Sjogren syndrome (SS) (n=16), and healthy controls (HC) (n=17) from a single centre in our study. We assessed each participant using a Schirmer test and the 5-item, SS Screening Questionnaire (SSSQ) – a validated questionnaire that has been suggested to distinguish SS patients from non-SSc patients in the SICCA study1.
Results: 80% of our ASIA patients complained of dry eyes. 57 of 78 (73.1%) had impairments of tear production (Schirmer test < 15 mm), with severe impairment of tear production (Schirmer's test < 5 mm) in 37/78 (47.4%) in ASIA patients. Severely impaired tear production was more prevalent in ASIA patients than HC ($p = 0.017$), with rates similar SS patients ($p = 0.681$). ASIA and SS patients had similar SSSQ scores ($p = 0.6355$), and rates of abnormal SSSQ ($p = 0.339$). Differences were however evident between ASIA and SS patients with regards to ANA, anti-SSA, anti-SSB and IgM levels ($p < 0.05$). Further analysis of ASIA patients with severe impairments in tear production (Schirmer's test < 5 mm) had reduced circulating Helper T cells ($p = 0.038$) and Naïve Helper T cells ($p = 0.004$) compared to ASIA patients with non-severe tear production – suggesting that tear production may be associated with a more profound immune dysregulatory state.
Conclusion: ASIA patients with silicone breast implants likely suffer from dry eyes due to impaired tear production, though they do not fulfill the classification criteria for Sjogren syndrome. The SSSQ was unable to differentiate sicca symptoms from SS or ASIA, however other biomarkers such as antinuclear antibodies may be helpful. Further investigation and mechanistic characterization is required to determine the relevance of more decreased circulating Helper T cells in breast implant-induced ASIA patients with dry eyes.

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Comparing Dermatologist and Rheumatologist Perspectives: Insights from the Quest (Quinacrine for Systemic Lupus Treatment) Survey

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Objectives: To evaluate the experience with quinacrine for the treatment of cutaneous lupus among dermatologists with expertise in rheumatic disease, and compare this to the experience of

rheumatology-based systemic lupus erythematosus (SLE) experts.
Methods: In November 2023, we conducted an electronic survey among members of the Rheumatologic Dermatology Society (RDS, n=20 dermatologists with rheumatic disease interest) and compared responses to those from April and August 2023 surveys of Systemic Lupus International Collaborating Clinics and Canadian Network for Improved Outcomes in Systemic Lupus Erythematosus (SLICC, CaNIOS, n=40) physicians. Participants provided information on quinacrine availability, prescribing practices, and perceived effectiveness and safety.
Results: All RDS respondents were from the United States (US), while SLICC+CaNIOS respondents were geographically diverse (65% North America, 25% Europe, 3% South America, 8% Asia). Quinacrine prescription rates differed markedly: 100% of RDS vs 43% of SLICC/CaNIOS had prescribed it for lupus. All RDS respondents had used quinacrine in combination with another antimalarial, versus 71% of those who had prescribed quinacrine in the SLICC+CANIOS group. Primary reasons for prescribing were similar: hydroxychloroquine/chloroquine intolerance (50% RDS, 71% SLICC+CaNIOS) and as an alternative following retinal toxicity (40% RDS, 47% SLICC+CaNIOS). Clinical benefit (in at least 1 patient) was reported by 95% of RDS and 71% of SLICC+CaNIOS respondents. Discontinuation rates varied: 30% of RDS reported no discontinuations, while all SLICC+CaNIOS reported at least 1 discontinuation, mainly due to lack of efficacy (59%) and/or adverse effects (59%). Conversely, RDS respondents primarily cited loss of availability (50%) as the reason for discontinuation. Future prescribing intentions differed: 95% of RDS would consider quinacrine for refractory cutaneous lupus if available, compared to 13% of SLICC+CaNIOS members. Key prescribing barriers were consistently identified as lack of availability (100% RDS, 88% SLICC+CaNIOS) and cost (60% RDS, 23% SLICC+CaNIOS).
Conclusion: We observed differences in experiences with quinacrine for lupus between dermatologists and rheumatologists. US-based dermatologists reported higher prescription rates, better perceived effectiveness, and fewer discontinuations. Some differences may reflect differences in quinacrine availability between groups, and both groups identified availability as the primary barrier for prescription. These findings suggest the need for interdisciplinary collaboration to optimize quinacrine use in lupus and underscore the importance of continued research to establish quinacrine's role in managing cutaneous and systemic lupus manifestations.

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Bullous Esophagitis with Severe Stricturing Disease, a Case Study of a Rare Systemic Lupus Erythematosus Manifestation

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The patient was initially seen as an outpatient with an esophageal stricture, thought then to be related to reflux from her SLE and potential esophageal dysmotility. Over several months she developed severe dysphagia causing weight loss, and subsequently presented to the ED with an impacted food bolus requiring endoscopic extraction and admission for sequential dilatation. On endoscopy, she had significant abnormalities of the proximal esophagus with a normal distal esophagus, stomach, and duodenum: not consistent with reflux-induced disease. Previous biopsy demonstrated non-specific active esophagitis; biopsy on this admission demonstrated positive

direct immunofluorescence with granular basement membrane zone immunoreactivity for immunoglobulins IgG and IgA, and weak immunoreactivity for IgM and C3, characteristics of immune complex deposition in SLE [3]. The differential for such bullous disease includes bullous pemphigoid, dermatitis herpetiformis, and epidermolysis bullosa acquisita. However, in this case the established SLE, granular deposition, and immune complex profile strongly suggest bullous lupus disease.

The patient had previously been managed with mycophenolate mofetil 500 mg BID (due to intolerance to hydroxychloroquine); this was escalated to 1000 mg BID, and she was started on moderate dose prednisolone (approx. 0.5 mg/kg, utilizing a liquid formulation given her severe dysphagia). To date the patient has improved and is now tapering her steroids, with consideration for escalation to biologic therapy with anifrolumab. Other treatment options include dapsone: commonly used for bullous skin disease.

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Management of Anti-Neutrophil Cytoplasmic Antibody Vasculitis-Associated Orbital Inflammatory Disease: a Systematic Literature Review

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Objectives: Ocular manifestations are common in ANCA-associated vasculitides (AAV). Orbital inflammatory disease (OID) represents a significant subset and remains a therapeutic challenge, as few management recommendations exist. This systematic review aimed to evaluate the effectiveness and safety of AAV-associated OID interventions.

Methods: We searched for clinical trials, case-control studies, observational studies and case series (>=5 patients) of adults undergoing therapy for AAV-associated OID within Embase Classic + Embase, MEDLINE(R) via Ovid, Web of Science Core Collection, Clinicaltrials.gov, and Cochrane Central Register of Controlled Trials without language or date restrictions. Studies were required to clearly report types and dosing of therapies, and clinical response after at least 1 month of follow-up. The primary outcome was clinical response, defined as any improvement in signs and/or symptoms, up to and including clinical remission. Secondary outcomes included clinical remission, relapse, sustained (>6 months) remission and serious adverse events. Two reviewers independently screened records and critically appraised articles using the Newcastle Ottawa Scale (NOS). We synthesized results qualitatively and performed a meta-analysis of proportions for outcomes with sufficient homogeneity using a random effects model and restricted maximum likelihood approach. Analyses were conducted using Stata SE (v18.0).

Results: Of 1001 unique studies identified, 119 were included in the full-text review, and 18 (14 retrospective cohort studies and 4 case series, 277 patients) met inclusion criteria. [Table 1]. Most (17/18) studies had NOS scores of >=5 (Good/Satisfactory). Treatment regimens (generally combined with glucocorticoids) varied across and within studies: 13 studies included patients who received rituximab (RTX), 10 studies included patients who received cyclophosphamide

(CYC), 7 studies included patients who received RTX plus another immunosuppressant (IS), 11 studies included patients who received conventional IS, and 7 studies included patients treated with surgery. Most studies (12/18) reported aggregate outcomes of multiple therapies. The most common time point for reporting outcomes was 6 months (5 studies, 4 of RTX and 1 of RTX+IS). Of these, 5/5 observed a clinical response in nearly all individuals. In the 4 studies of RTX monotherapy, 84% (95% CI 72%-95%, $z=14.35$, $p< 0.001$) achieved complete response at 6 months. Other secondary outcomes are summarized in Table 1.
Conclusion: Studies reported on several therapies for AAV-associated OID. Pooled estimates showed high rates of remission with RTX at 6 months, and qualitatively, high rates of remission were also reported for RTX + conventional IS. Our results emphasize the necessity of larger, prospective studies examining treatments for AAV-associated OID.

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Anti-Myeloperoxidase Antineutrophil Cytoplasmic Antibody Associated Vasculitis Results in Aortic Valvulitis and Severe Aortic Regurgitation

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We report the case of a 65 year-old female with a history of Anti-MPO AAV who was initially diagnosed with manifestations of sensorineural hearing loss and scleritis, and who was treated with Methotrexate. Transthoracic echocardiogram at diagnosis demonstrated mild-moderate aortic regurgitation and normal biventricular function.

Six months later, she presented with worsening dyspnea and was found to have significant hypotension and elevated serum lactate. Transesophageal echocardiography was performed and revealed severe aortic regurgitation with a central coaptation defect, severe left ventricular dysfunction, and no vegetations consistent with infective endocarditis. She underwent urgent surgical aortic valve replacement and stabilized with this intervention. Peripheral blood cultures were negative, and aortic valve pathology demonstrated active necrotizing valvulitis with negative microbiological stains. A diagnosis of Anti-MPO AAV valvulitis was made, and treatment with glucocorticoids and Rituximab was initiated.

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Clinician Views and Clinic-Pathologic Correlations Concerning the Prevalence and Impact of Granulomas on Diagnosis, Management, and Outcomes of Anca-Associated Vasculitis: an International Survey

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Objectives: Granulomatous inflammation occurs in ANCA-associated vasculitis (AAV), however, which manifestations are attributable to granulomas are unclear. We sought to understand clinician beliefs concerning which manifestations of AAV are attributable to

granulomas and if the presence of granulomas informs diagnostic, prognostic and treatment decisions.
Methods: We conducted an international survey of physicians who care for individuals with AAV with the following domains: clinical experience; the extent to which the presence of granulomatous manifestations impact diagnosis, prognosis, and treatment; how frequently granulomas are responsible for individual AAV manifestations; and how granulomatous manifestations affect choice of induction therapy. The association of manifestations on induction therapy was assessed using a multivariable linear regression model adjusted for clinician demographics and practice experience.
Results: We received 161 responses, of which 142 from 35 countries contained usable data. Respondents at least partially agreed (median response ≥5 on a 7-point Likert scale) that granulomatous manifestations increased risk of relapse, respond differently to therapy, and caused more damage than non-granulomatous manifestations. Across the 36 manifestations of AAV, respondents considered pulmonary nodules, retro-orbital masses, sinus involvement, and subglottic stenosis caused by granuloma (caused by granulomas in ≥70% of cases). Twenty-three were considered to not be caused by granulomas in most cases (≤30% of cases). Induction therapy did not differ on the basis of granulomatous manifestations (p-value range=0.26 – 0.97).
Conclusion: Respondents similarly identify that granuloma may be important in the management of patients with AAV and which manifestations are granulomatous and which are non-granulomatous. Despite this, they did not differ in choice of induction therapy.

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Engaging Community Pharmacy to Improve Seasonal Vaccination in Patients Living with Vasculitis

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Objectives: Vasculitis refers to a group of autoimmune disorders causing inflammatory damage of blood vessels leading to end organ damage. Treating these conditions often requires therapeutic immunosuppression. This immunosuppression is associated with an increased risk of infection, a leading cause of mortality in vasculitis.[1] Vaccinations reduce the risk of certain infections but are underutilized.[2] Novel strategies to promote patient vaccination are crucial to reduce infections. In this study, we implemented a multidisciplinary approach involving community pharmacies to improve the rate of seasonal vaccination.
Methods: 103 patients > age 18 living with vasculitis seen in one tertiary centre in Calgary,Alberta were recruited. Their vaccination status against COVID-19 and influenza was documented to establish a baseline. As part of a multidisciplinary vaccine promotion approach, we provided these patients with education on the importance of vaccination and contacted their pharmacy of choice to arrange vaccination if the patient was not up to date. The vaccination status of patients was then reviewed at the 16-month time point to determine subsequent vaccination rate.
Results: At baseline 15% of patients had received their seasonal influenza vaccination and 39% of patients had received >3 mRNA COVID-19 vaccinations. Following the multidisciplinary vaccine promotion intervention, the rates of vaccination for the 2023-2024 season increased to 49% for influenza vaccination and 65% for receiving >3 mRNA COVID-19 vaccines. Compared

to the provincial rates for the same time period, our intervention resulted in 2x higher influenza vaccination rates and nearly 3x higher COVID-19 vaccination rates (Image 1). Additionally, a vaccine hesitancy survey was provided to better understand hesitant patient behavior. 47 patients agreed to provide their reasoning for not completing their vaccination series. Timing (making time, remembering to go) was the major obstacle noted by 31/47 (66%) while mistrust of vaccines (lack of belief in efficacy, potential to cause harm) was expressed by 19% (9/47). Of these patients 83% (39/47) stated they would receive vaccination on-site at the time of their next rheumatology appointment if it were offered by a health professional.
Conclusion: Engaging patients' community pharmacy to promote and administer seasonal vaccination was an effective preventative care initiative. There were improved vaccination rates for influenza and COVID-19 and our final vaccination rates were superior to provincial rates over the same time period. As a QI initiative, this study highlights an effective multidisciplinary approach to improving patient vaccination. Such approaches are especially salient increasing burden on rheumatologists to ensure risk reduction in multiple domains. **Practice Reflection Award**

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Using the Southern Alberta Vasculitis Registry to Assess Quality of Care Standards for Giant Cell Arteritis

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Objectives: Using the Southern Alberta Vasculitis Registry, review quality of care metrics for Giant Cell Arteritis (GCA).
Methods: The SAVR was searched for GCA cases. All cases met ACR classification criteria for GCA to improve comparability with other studies.[1] Living and deceased patients were included. The audit standards recommended by the UK GCA Hospital Quality standards (GHOST) were reviewed and included: Time to ultrasound, time to temporal biopsy, time to and PET/CT following request.[2] These audit standards were in keeping with the recommendations noted in the ACR/VF 2021 GCA treatment guidelines.[3]
Results: Table1 shows full breakdown. High dose steroids: The GHOST benchmark is administration of high dose steroid within 24 hrs. The SAVR median (1 day) met this standard but not the mean (2.91 days, range 1-16 days). 88% of patients received high-dose steroids. Of these, 11% (5/45) received methylprednisolone. All cases of methylprednisolone use involved patients with vision loss or stroke features. Patients who did not receive high dose steroids either had lower dose steroid started by non-rheumatologist (2/45) or had an incidental disocery of their GCA and were on alternative therapies (3/45). Time to temporal artery biopsy (TAB): The median (4 days) and mean (15.04 days) both meet the GHOST benchmark (28 days). The mean did not meet the ACR/EULAR recommendations of TAB within 14 days. 51% of patients received TAB, 74% of those had a positive TAB. Time to temporal artery ultrasound (TAUS): The median (6 days) but not the mean (16.75 days) met the GHOST benchmark (7 days). 36% of patients receive TAUS and 75% of those had a positive TAUS. Time to PET/CT: Neither the median (38 days) nor the mean (37 days) met the GHOST benchmark (7 days). Only 8.9% (4//45) patients had PET/CT imaging as part of their baseline imaging for GCA.
Conclusion: This study highlights the importance of establishing local clinical care pathways for

GCA diagnosis and management. While the GHOST benchmarks provide useful context, some of the standards are not readily applicable due to resource limitations in some jurisdictions (ex. PET/CT within 7 days of diagnosis). A further limitation of the GHOST recommendations are using time to intervention from steroid initiation rather than time to intervention from GCA diagnosis. Local concerns, not captured by GHOST benchmarks include high variable time to diagnosis (average 80.17 days, median 42 days, range 1-375 days) and low baseline large vessel imagine (CTA-8.8%, MRA-6.7%). **Practice Reflection Award**

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A Review of the Causes of Death Among Patients in the Southern Alberta Vasculitis Registry

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Objectives: To evaluate patient causes of death from the Southern Alberta Vasculitis Registry (SAVR).

Methods: Patient cases were reviewed from the SAVR up to the cut-ff of July 2024. Descriptive statistics were used to describe the findings.

Results: There were 54 deceased patients in the SAVR. 25 patients were male (46%) and 29 were female (54%). The average age of death was 76.4 years. The average years between vasculitis diagnosis and death was 5.7 years (range: 0-21 years). A full summary of represented vasculitides is seen in Figure 1 but the top three vasculitis types were giant cell arteritis (26%), granulomatosis with polyangiitis (20%), and microscopic polyangiitis (11%). Infection was the most common cause of death at 27.8% (15/54) with pneumonia being the most common form of infection (13%, 7/54). Reviewing the charts for these cases, 53% (8/15) of patients who died of an infection were on a corticosteroid (all prednisone). The average prednisone dose at time of death was 17.75mg (range 2-60mg). 75% (6/8) of these patients had active vasculitis at the time of death. Cancer and cardiovascular disease were tied for the second leading cause of death (20%,11/54 for each). Vasculitis preceded cancer in 10/11 cases. In the exception case, the patient had vasculitis secondary to endometrial cancer. Lung cancer was the most common type of cancer leading to death (36% of cancer cases, 4/11). The smoking data available was incomplete limiting further analysis. There was one case of bladder cancer (occurred in patient with cumulative cyclophosphamide exposure >100g), but the cause of death in this patient was pancreatic cancer. Aside from being a leading cause of death, 41% (22/54) patients had some form of cancer at time of death. Heart failure and stroke were the most common cardiovascular causes of death.

Conclusion: Infection, cancer, and cardiovascular disease as leading causes death in the SAVR registry are in keeping with findings in the literature.[1,2] Patients in this cohort were older at diagnosis (70.7 years) than the wider SAVR (58.1). The high rate of death from cancer and high prevalence of cancer in this cohort represent noteworthy findings. The impact of long-term immunosuppression (length time and higher doses), use of agents associataed with cancer (ex. cyclophosphamide, azathioprine), and older patient age may all be contributing factors. Future studies will look at rate matching by vasculitis type against the local general population and other vasculitis studies.

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The Southern Alberta Vasculitis Registry: Review of the Current State and Future Initiatives

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Objectives: Established in 2012, the Southern Alberta Vasculitis Registry (SAVR) was intended to create a reliable, local database for vasculitis research. In this quality improvement study, we review the current state of the SAVR and propose avenues for future use and improvement.
Methods: The SAVR collected patient demographics and disease-related information from patients referred to the Southern Alberta Vasculitis Clinic. De-identified patient sera samples were also collected and stored by Mitogen labs. The SAVR findings up to August 2024 were reviewed. Descriptive statistics were used to describe the findings. A search of the literature was also conducted to determine if there were any publications produced relating to the SAVR.
Results: 343 patients were identified in total. 287 patients were living and 56 patients were deceased. The average age of patients in the registry was 58.1 (median 60, range 20-95). 33% (113/343) patients were male and 67% (210/343) patients were female. Among the living patients, 9.8% (28/287) had active vasculitis disease, 76% (219/287) were in documented remission. The average duration of vasculitis for registry patients was 10.3 years (median 10 years, range 1-43). There were 82 cases of granulomatosis with polyangiitis, 45 cases of giant cell arteritis, 31 cases of Takayasu, 26 cases of Behcet's, 23 cases of secondary vasculitis (most common cause being rheumatoid arthritis representing 22% of these cases), 21 cases of IgA vasculitis, 20 cases of microscopic polyangiitis, 19 cases of single organ vasculitis, 18 cases of eosinophilic granulomatosis with polyangiitis, 12 cases of polyarteritis nodosa, 12 cases of other small vessel vasculitis, 9 cases of other large vessel vasculitis, and 23 cases of unknown/unspecified vasculitis. To date, three papers have been published using data from the SAVR: A three-year review and two biomarker studies (LAMP-2 and anti-DSF70). [1,2]
Conclusion: Given the low incidence and prevalence of vasculitis, the presence of a vasculitis database is of considerable importance. The current registry holds valuable sociodemographic data and disease information (ex. vasculitis disease type, activity, treatment). In addition to future biomarker studies, this registry will serve as a resource for epidemiological research (ex. incidence, morbidity/mortality studies), quality of life studies, and potential clinical trials. Reviewing the literature, we found that high-yield initiatives for knowledge translation would include implementing data collection methods which would harmonize with other registries to allow research collaboration and the application of registry findings to the creation of local clinical pathways.

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Phenotypic Spectrum of Adult Autoinflammatory Patients Carrying the Mefv E148Q Variant - a Case Series

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Jenny Shu (University of Toronto, Toronto)
Objectives: To describe the phenotypic spectrum of adult autoinflammatory patients carrying the MEFV E148Q variant.
Methods: Patients were enrolled from an autoinflammatory clinic in Toronto. Inclusion criteria were age >18 years, unexplained inflammatory features with genetic testing positive for the MEFV E148Q variant. Gene panel was performed at the Division of Genome Diagnostics, Hospital for Sick Children. All patients provided written consent to be included in a case series.
Results: Epidemiology 17 patients were included (82% female). The most common ethnicities were Southeast Asian (35%), followed by South Asian (33%). The mean age was 39 years, and the mean age of disease onset was 22.6 years. Eight patients had a family history of similar symptoms. Clinical Features Patients carried clinical labels such as Unclassified Systemic Autoinflammatory Disease or atypical FMF (both 5/17), FMF (3/17), PFAPA (2/17), and Behcet's or Still's disease (both 1/17). 10 patients experienced flares with intermittent wellness, and 7 had flares with chronic lingering symptoms. 9/17 identified triggers with stress and physical exertion being the most common. Recurrent fevers >38°c were present in 11 patients. The most common organ system affected was dermatologic (12/17 patients). Oral ulcers and urticaria-like lesions were the predominant manifestations. Neutrophilic infiltration was demonstrated in two out of three skin biopsies. Other manifestations included arthritis (11/17), gastrointestinal symptoms (10/17) and aseptic pharyngitis (7/17). CRP was elevated during inflammatory flares in 13/15, and even at baseline in 4/15 patients. Colchicine was effective in 13 out of 15 patients. Two were started on interleukin-1 inhibitor; both showed clinical and biochemical improvement. Genetic Architecture 13/17 patients carried additional variants. The most common were MEFV, NLRP3, and NOD2. Exome sequencing was performed in 3 patients with no diagnostic results.
Conclusion: To our knowledge, this is the largest cohort of patients gathered with the MEFV E148Q variant. While a minority of patients did not show signs of inflammasomopathy (e.g. distinct flares / elevated CRP / response to colchicine), some exhibited these classic features of FMF. Some patients exhibited features unusual for FMF but appeared autoinflammatory in nature (e.g. mucocutaneous ulcerations, hive-like lesions with neutrophilic dermatoses on biopsy). These observations may suggest that E148Q is a low penetrance variant with variable expressivity, and possibly associated with unique clinical features that fall outside the spectrum of classic FMF. Larger multicenter cohorts with exome sequencing and functional studies will be helpful in further elucidating the role of MEFV E148Q in patients presenting with autoinflammation.

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Adult Patients with Familial Mediterranean Fever - a Single Center Case Series

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Objectives: Describe the clinical characteristics of adult patients with FMF (Familial Mediterranean Fever) and identify potential challenges in the diagnosis and treatment in this

population.
Methods: Patients over age 18 years meeting the Tel HaShomer diagnostic criteria for FMF were recruited from an Autoinflammatory Clinic in Toronto. Clinical records and data were reviewed and analyzed. Gene panel testing was performed at the Division of Genome Diagnostics, Hospital for Sick Children. All patients provided written consent to be included in a case series.
Results: A total of 22 patients were included (59% male). The cohort was composed of a variety of ethnicities including Middle Eastern (45%), Caucasian (18%), Southeast Asian and African (both 14%). The median ages at enrollment were 45 years, symptom onset (12.5 years), and diagnosis (35.5 years). Seven patients had first symptom onset after age 18. The median diagnostic delay was 7.5 years. A family history of FMF was present in 63% of patients. The most common trigger for flares was stress (41%). The most common symptoms were abdominal pain (95%), followed by fever (91%) and arthritis (72%). CRP was elevated during flares in 89% of patients. Notable comorbidities included spondyloarthropathy in two patients. Genetic testing was available in 20 patients. 14 were homozygous and 6 were heterozygous for variants in MEFV. The most common variants were V726A (7/20), M694V/M680I/E148Q (each in 4/20), and M694I (2/20). All were variants of uncertain significance, or likely/pathogenic by American College of Medical Geneticists classification. One patient carried 3 variants in MEFV (homozygous E148Q, and p369S), while 2 patients carried additional NOD2 variants (R791W, R702W). 86% of patients responded to colchicine, but 55% reported side effects. As such, IL-1 inhibitors such as anakinra or canakinumab were applied for to the provincial Exceptional Access Program in 8 patients. Funding for this medication was denied in 7 of them. Compassionate medication release was provided to 5 patients, for which 4 exhibited marked benefit.
Conclusion: FMF remains an under-recognized entity as demonstrated by the significant diagnostic delay (maximum 42 years) in our cohort. Moreover, it can present for the first time in adulthood (32% of our cohort). IL-1 blockade has been shown to be highly effective, but limited access to public funding remains a significant barrier. It will be important to continue to raise awareness for FMF and advocate for improved access to genetic testing as well as effective, evidence-based therapy.

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Hospitalizations for Ambulatory Care Sensitive Conditions by Persons with Rheumatoid Arthritis: a Population-Based Study Using Administrative Data

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Objectives: Ambulatory care sensitive conditions (ACSCs) are conditions where appropriate access to ambulatory care can reduce hospitalizations. People with rheumatoid arthritis (RA) are at higher risk for ACSC hospitalizations due to consequences of systemic inflammation and insufficient management of the condition in ambulatory practice. This project aims to estimate rates of avoidable hospitalizations by persons with RA relative to the general population.

Methods: We conducted a retrospective cohort study in Alberta, a province of ~4.6M, of individuals meeting a validated case definition for RA based on ICD codes in years 2002-2023. Controls were identified by matching age, sex, and date of diagnosis. There was a 5-year washout period to identify incident RA cases. We identified ACSCs using established ICD codes from the Canadian Institute for Health Information (including grand mal seizures, chronic lower respiratory diseases, asthma, diabetes, heart failure and pulmonary edema, hypertension, and angina). Incidence rate ratios (IRR) up to 5 years from the date of diagnosis were calculated using a multivariable regression model adjusting for age, sex, and location of residence.
Results: From a prevalent RA cohort composed of 52,596 individuals and 210,384 controls, there were 25,281 cases and 70,313 controls with hospitalizations during the study period. The number of hospitalizations was 83,811 in cases and 190,304 in controls, where 8.3% and 9.1% were for all ACSCs combined, respectively. Among cases, the highest frequency of ACSC hospitalizations was for chronic lower respiratory diseases at 3.8% (3202/83811). For all ACSCs combined, RA cases had a 14% higher risk of being hospitalized compared to the general population (IRR 1.14, 95% CI 1.08, 1.20). The risk of being hospitalized for heart failure and pulmonary edema was significantly higher among RA cases compared to those without RA (IRR 1.12, 95% 1.01, 1.25). [1]
Conclusion: Persons with RA are at a higher risk of avoidable hospitalizations in the first 5 years after diagnosis compared to those without RA. Improved ambulatory care access and quality, inclusive of primary care and subspecialty care, is needed to prevent unnecessary hospitalizations and reduce burden on the acute care system.

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Emergency Department Visits for Ambulatory Care Sensitive Conditions by Persons with Rheumatoid Arthritis: A Population-Based Study

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Objectives: Ambulatory Care Sensitive Conditions (ACSCs) are conditions where appropriate access to ambulatory care could prevent or reduce complications, a more severe disease course, or the need for hospitalizations. We conducted this study to estimate the emergency department (ED) visit rates for ACSCs by persons with rheumatoid arthritis relative to age- and sex-matched general population controls.
Methods: We conducted a retrospective cohort study in Alberta, identifying individuals meeting a validated case definition for RA based on ICD-9-CM and ICD-10-CA/CM codes from 2002-2023. General population controls were identified by matching age, sex, and date of diagnosis. ED visits for any ACSC, as defined by the Canadian Institute for Health Information (grand mal seizures, chronic lower respiratory diseases, asthma, diabetes, heart failure and pulmonary edema, hypertension, and angina) were identified by ICD codes listed as the most responsible diagnosis in the National Ambulatory Care Reporting System (NACRS). The frequency of any ACSC ED visit and incidence rates and ratios between cases and controls were calculated five years from date of diagnosis using a multivariable regression model.
Results: From the incident cohort of 52,596 cases and 210,384 controls, there were 39,288

cases and 117,828 controls with an ED visit (67% female, 56% urban, mean age 64 years; comparable between cases and controls). Approximately 75% of the incident cohort has had atleast one ED visit from 2007-2023. There was a 76% increase in the frequency of ED visits for ACSCs among cases over the study period, from 3.3% of all ED visits by cases in 2007 to 5.8% in 2023. After adjusting for age, sex, and location, the incidence rate for ACSC ED visits among those with RA was 24.06 per 100 person-years (95% CI 21.34 – 27.12) and 21.45 per 100 person-years (95% CI 19.68 – 23.39) for controls. [1] The adjusted incidence rate ratio showed that RA cases had a 12% higher risk of ACSC ED visits compared to controls (IRR 1.12, 95% CI 1.08, 1.16).
Conclusion: People with RA have a 12% higher rate of avoidable ED visits in the first 5 years following diagnosis compared to those without RA. Over the years, more persons with RA have visited the ED for ACSCs, with a marked reduction during the COVID-19 pandemic restrictions. Improved ambulatory care access and quality, inclusive of primary care and subspecialty care, is proposed to reduce the burden on the acute care system and improve quality of care.

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Lyme Arthritis in Rheumatological Practice: A Survey of Canadian Pediatric Rheumatologists

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Objectives: Arthritis is a common manifestation of Lyme disease (LD) in children and resembles other forms of inflammatory arthritis including JIA. Up to 15% of children with Lyme arthritis (LA) have persistent arthritis despite adequate antibiotic therapy, called post-infectious LA (PILA), and present diagnostic and treatment challenges. The impact of LA is likely to grow with the predicted increase in incidence and geographic distribution of LD [1,2]. The study's objective was to gain an understanding of the clinical burden, clinical practices, and research priorities of Canadian pediatric rheumatologists (PRs) in caring for children with LA.
Methods: An online survey was distributed to all PRs identified through the Canadian Rheumatology Association membership directory in May 2024. We collected information on practice characteristics, models of care, management, and research priorities regarding LA. Descriptive statistics are reported.
Results: 40/69 PRs (58%) responded; 80% (32/40), reported caring for patients with LA. PRs in the Atlantic and Eastern regions see the most LA (Table 1). 56% of respondents feel that PRs should assess the response to the first course of antibiotics; 26% would involve PRs only after another health care provider determines incomplete response to the first course of antibiotics, 3% only in a patient diagnosed with PILA, and 23% depending on other factors, primarily non-PRs musculoskeletal examination abilities. Following the first course of antibiotics, in children who have improved, but have persistent symptomatic arthritis, 66% (21/32) would recommend a 2nd course of oral antibiotics; 16% (5/32) would recommend an intraarticular steroid injection (IAS) (4 with antibiotics, 1 alone); and 19% (6/32) were unsure/didn't respond. In children with minimal/no response to the first course of antibiotics, the top responses were divided between a 2nd course of oral antibiotics (9/32), IV antibiotics (9/32) or an IAS with antibiotics (9/32). The top priorities identified for research were to (1) determine optimal treatment for patients who do

not fully respond to the first course of antibiotics, (2) define optimal models of care, and (3) develop tests to aid in the diagnosis of LA and differentiate it from other forms of arthritis. **Conclusion:** Children with LA are seen by PRs across Canada however models of care vary and there is variability in treatment approaches. We have identified research priorities including determining optimal treatment in those who do not respond to the first course of antibiotics and exploring models of care which will allow timely access to high quality care.

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A Rare Coexistence of Sapho Syndrome and Hidradenitis Suppurativa: Case Report and Clinical Insights

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Case: A 28-year-old male from an Indian Ocean's Island with a two-year history of multiple skin lesions including acne, pustules, and anorectal abscess and a 4-month history of recurrent musculoskeletal pain, presented to hospital with fever and an acute pain in the left elbow and in the right wrist increasing in recent days. During examination, two synovitis were found and 10 cm by 10 cm ulcerations were observed in the axillary regions with serous discharge, granulation and sinus tracts which was later found to be HS. Anamnesis revealed that these skin lesions had been evolving for 2 years and that the patient was reluctant to seek medical assessment. During hospitalization, blood work revealed leukocytosis, thrombocytosis, eosinophilia, and c-reactive protein reaching 137 mg/L. A bone scan revealed bilateral uptake on acromioclavicular and sternoclavicular bones and the first costochondral junctions, which was consistent with the diagnosis of SAPHO syndrome. After an infusion of pamidronate 60 mg, bone pain was considerably improved, and skin lesions abated with local care only.

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Recurrent Monoarthritis in a 40-Year-Old Woman

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A 40-year-old woman with a past history of Grave's disease presents to the emergency room with left wrist pain and swelling, alongside a five-year history of intermittent monoarthritis affecting various joints, including ankles, wrists, knees and shoulders. Each episode resolved spontaneously within five days, raising a suspicion of crystal-induced arthritis. Initial treatments with NSAIDs, followed by a combination of colchicine, hydroxychloroquine, and methotrexate provided minimal relief, and flare-ups were occurring twice monthly. Steroids were effective but caused significant side effects even with short-term use.

Physical examination revealed a left wrist effusion and tenderness over the right sternoclavicular joint. Imaging of the left wrist demonstrated significant chondrocalcinosis with dense mineralization of the ulnocarpal space and intercarpal hyaline cartilage. Ultrasound identified a

small radiocarpal joint effusion with synovial thickening, nodularity, and hyperemia that were compatible with synovitis. The imaging findings were compatible with CPPD arthropathy with active inflammation at the wrist. Initial synovial fluid analysis was negative (left wrist) but subsequently positive in the knee, confirming CPPD crystals. Laboratory evaluation revealed significant hypomagnesemia of 0.45 mmol/L (normal range 0.66 - 1.07 mmol/L)

Despite ongoing oral magnesium supplementation, her hypomagnesemia persisted, and renal wasting was confirmed by the fractional extraction of magnesium (FeMg) in a 24-hour urine collection. Genetic testing revealed a heterozygous pathogenic variant in HNF1B, which is associated with renal magnesium wasting and polycystic kidney disease.

Due to the inadequate response to the conventional disease-modifying agents and persistent recurrent monoarthritis, the patient was given on-demand anakinra, which shortened the duration of her flare-ups and reduced her need for corticosteroids. Since recurrent episodes continued, anakinra was changed to daily dosing, which essentially abolished the episodes, contributing to an improved quality of life.

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Modulating the Gut-Joint Axis: The Impact of Anti-TNF Therapy on Gut Microbiota in Ankylosing Spondylitis – A Systematic Review

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Objectives: Ankylosing Spondylitis (AS) is a chronic inflammatory disorder that primarily affects the spine and pelvis. Here, we aim to explore the Gut Joint Axis in AS with a focus on changes in alpha diversity (diversity within a single sample) and beta diversity (differences in microbiota composition between samples) following Anti-TNF treatment.

Methods: A comprehensive search of PubMed, Web of Science, Scopus, Embase, and Cochrane databases was conducted up to May 2024. Studies comparing fecal microbiota composition in AS patients before and after Anti-TNF therapy were identified and selected based on PRISMA guidelines. From an initial pool of 1,163 studies, 5 met inclusion criteria, involving 230 AS patients and 209 healthy controls (HC). We excluded duplicates, animal studies, case reports, conference abstracts, non-English articles, irrelevant studies, non-full-text manuscripts, and Mendelian randomization studies, as these do not provide direct observational data on microbiota composition and could introduce methodological heterogeneity.

Results: After manually screening 197 studies, 5 manuscripts were included—comprising 4 prospective cohorts and 1 case-control study. All the studies were conducted in China, with 16S rRNA sequencing used in 3 studies and Shotgun sequencing in 2 studies. None of the patients or controls in the included studies received antibiotics within the 3 months prior to enrollment. Across multiple studies, Anti-TNF therapy significantly impacts gut microbiota composition in AS patients, often shifting it towards a pattern more similar to healthy controls. Both alpha and beta diversity metrics show that AS patients have distinct gut microbiota compositions compared to healthy individuals, but Anti-TNF therapy appears to reduce these differences, suggesting a restorative effect on the microbiome [Table 1].

Conclusion: Our analysis underscores the potential role of gut microbiota as a target in AS treatment. The effect of Anti-TNF therapy on gut microbiota could potentially contribute to its therapeutic efficacy in managing Ankylosing Spondylitis.

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Characterization of Fecal Microbiota in Ankylosing Spondylitis: Pathogenesis Insights and Therapeutic Opportunities – a Systematic Review

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Objectives: Recent evidence suggests that the gut microbiota may play a crucial role in the pathogenesis of Anklyosing Spondylitis (AS). This systematic review aims to examine the existing literature to explore changes in gut microbiota composition between AS patients and healthy controls (HC) to identify microbial signatures associated with AS. Understanding these alterations could enhance our knowledge of the mechanisms underlying AS.
Methods: We queried PubMed, Web of Science, Scopus, Embase, and Cochrane databases through May 2024 to identify studies comparing stool microbiota composition in AS patients and healthy controls (HC). Following PRISMA guidelines, our search yielded 1,163 studies. We included studies comparing microbiota in AS patients and HC. We excluded duplicates, animal studies, case reports, conference abstracts, non-English articles, irrelevant studies, non-full-text manuscripts, and Mendelian randomization studies, as these do not provide direct observational data on microbiota composition and could introduce methodological heterogeneity.
Results: After screening 184 studies, 18 manuscripts were included: 14 prospective cohort studies, 2 case-control studies, and 2 cross-sectional studies. These studies covered a total of 900 ankylosing spondylitis (AS) patients and 734 healthy controls (HC). The majority of the participants were male, with 73.8% in the AS group and 66.7% in the HC group, and most participants (73.4%) were of Asian descent. HLA-B27 status was reported in 13 studies, with a 92.3% positive rate among the AS patients. Notably, none of the AS or HC participants, except for one study, had received antibiotics in the 3 months prior to enrollment. At the phylum level, 12 studies (66.6%) reported significant changes in microbiota composition. Actinobacteria, Firmicutes, and Proteobacteria were increased in 8, 6, and 5 studies, respectively, while Bacteroidetes, Fusobacteria, and Verrucomicrobia were decreased in 5, 3, and 3 studies, respectively. At the genus level, 16 studies (88.8%) observed changes. Prevotella, Escherichia-Shigella, Streptococcus, and Collinsella were increased in 6, 6, 5, and 4 studies, respectively, while Bacteroides, Lachnospira, and Dialister were decreased in 9, 4, and 4 studies, respectively. Prevotella and Collinsella have been linked to inflammatory diseases in previous studies, suggesting their potential involvement in the inflammatory processes observed in AS patients. On the other hand, a reduction in Lachnospira has been associated with increased inflammation, indicating its potential protective role in inflammatory conditions.
Conclusion: Our findings reveal significant differences in gut microbiota composition between AS patients and healthy controls, indicating a role of microbiota in AS pathogenesis. These findings highlight the potential for microbiota-targeted therapies in AS treatment.

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The Frequency of Diffuse Idiopathic Skeletal Hyperostosis (DISH) in Spondyloarthritis in Comparison to Age and Sex-Matched Controls and Impact of SpA on Onset Age of DISH

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Objectives: Although diffuse idiopathic skeletal hyperostosis (DISH) is classically defined in the thoracic spine and the elderly population, there are case reports on the overlap between cervical DISH and spondyloarthritis (SpA) (1). We aimed to compare the frequency of cervical DISH in SpA vs controls to see whether there is a true increased frequency and if the presence of SpA impacts the onset age of DISH.
Methods: The SpA population included patients who were diagnosed with axial or peripheral SpA, followed at the Arthritis Centre and had cervical spine x-rays for screening purposes between 2016-2020. The control group included patients who presented to the Emergency Department and had a cervical spine x-ray for any reason. Four control patients for each SpA patient were age- and sex-matched. An investigator meeting on the definitions took place before the study, followed by an agreement exercise. Two radiologists independently scored the radiographs for the confidence level for the presence of DISH on a scale between 0-5. The ICC of the two radiologists were 0,935. For the study, the radiographs were read by one of the two radiologists, who distributed the cases and controls equally among the two radiologists. The confidence of Grade 3 was considered as DISH positive.
Results: One-hundred-ninety-one SpA and 764 age- and sex-matched controls were included (table). DISH was observed in 26 (13.6%) SpA patients and 108 (14.1%) controls, with similar frequencies (p=0.852). The age of DISH+ patients was statistically significantly lower in the SpA group than the control group (median (IQR); 54 (16) vs 59 (13); p=0.026). DISH was higher in males than females in both SpA (n:19/104 (18.3%) vs n:7/87 (8%); p=0.04) and control groups (n:74/416 (17.5%) vs n:35/348 (10.1%); p=0.003). There were 143 (74.9%) SpA patients with known HLA-B27 status. The frequency of DISH in HLA-B27(-) SpA patients was higher than HLA-B27(+) SpA patients numerically (n=14/65 (21.5%) vs n=8/78 (10.3%); p=0.063). Interestingly, HLA-B27 had different effects on the presence of DISH in subgroups: AxSpA patients (radiographic and non-radiographic combined) had more DISH if they were HLA-B27 positive (12.5% vs 8.7%), unlike the PsA, who had DISH exclusively if they were HLA-B27 negative (28.2% vs 0%)
Conclusion: The frequency of DISH in SpA patients is similar to the general population. However, SpA patients develop DISH at an earlier age. Our observation of the differential impact of HLA-B27 on axSpA vs PsA may signal the different mechanisms impacting the spine in both diseases.

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Baseline Power Doppler Positivity Predicts Response to Advanced Therapies in Rheumatoid Arthritis

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Objectives: Our recent systematic literature review highlighted the controversies regarding the predictive value of baseline Power Doppler (PD) positivity on Ultrasound (US) for treatment

response in rheumatoid arthritis (RA), likely due to the heterogeneity of the trials and outcome measures1. In this study, we aimed to explore the predictive factors of response to advanced therapies in RA and whether baseline PD positivity is an independent predictor of response, by testing different response measures.

Methods: RA patients were recruited from the ORCHESTRA (Ottawa Rheumatology CompreHEnSive Treatment and Assessment) Clinic, where all patients with RA about to initiate a new advanced therapy are assessed following a standardized protocol, including a protocolized US of 36 joints, at baseline and three-month intervals until clinical remission is achieved. The US scoring is based on the OMERACT-EULAR definitions, where grayscale synovitis and Doppler findings in each joint are scored on a scale of 0-3. For the analysis, having at least one joint with a Doppler score ≥2 was classified as the Doppler-positive group, and the rest was defined as the Doppler-negative group. The groups were compared for their Delta (D) DAS28CRP (baseline minus month-3), achieving Minimal clinically important difference (MCID) (DDAS28CRP ≥0.6) and DAS28CRP remission at follow-up. A multivariate analysis was performed to understand whether baseline PD positivity is an independent predictor of achieving MCID.

Results: Baseline: Of 101 patients, 80 (79.2%) were classified as Doppler-positive, and 21 (20.8%) were Doppler-negative. Demographics were similar between the groups (table). There was a trend towards baseline DAS28CRP scores being higher in the Doppler-positive group and significantly more frequent erosions on X-rays. Follow-up: In the three-month follow-up, the Doppler-positive group had significant reductions in their DAS28CRP scores ($p<0.001$); but not the Doppler-negative group ($p= 0.22$). DDAS28CRP was numerically higher and achieving MCID was significantly more common in Doppler-positive group (table). The percentage of patients in DAS28CRP remission at follow-up was similar between Doppler-positive and negative patients. In multivariate analysis, baseline DAS28CRP and Doppler-positivity were the only predictors of achieving MCID (Table).

Conclusion: The baseline Doppler positivity independently predicts a better response to advanced therapies in RA. However, the response may not be enough to remission due to higher baseline disease activity. The Doppler-positive patients achieved MCID 3.8 more often than the Doppler negatives. Our data encourages conducting a prospective trial using US positivity in the decision-making process for advanced therapies in RA.

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Low Uveitis Rates in Patients with Axial Spondyloarthritis or Psoriatic Arthritis Treated with Bimekizumab: Long-Term Results from Phase 2B/3 Trials

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Objectives: Bimekizumab (BKZ) is a monoclonal IgG1 antibody that selectively inhibits interleukin (IL)-17F in addition to IL-17A. Here, we report long-term incidence of acute anterior uveitis ('uveitis') following BKZ treatment in patients (pts) with axial spondyloarthritis (axSpA) or psoriatic arthritis (PsA).
Methods: Safety data are reported for two pools, each comprising three phase 2b/3 studies and their open-label extensions, in pts with active axSpA (non-radiographic and radiographic axSpA) and active PsA, respectively. Uveitis events were identified using the preferred terms "autoimmune uveitis", "iridocyclitis", "iritis", and "uveitis", coded according to MedDRA v19.0; note that "acute anterior uveitis" was not a specific preferred term available in MedDRA v19.0. Uveitis rates and exposure-adjusted incidence rates (EAIR) per 100 pt-years (PY) for pts who received ≥1 BKZ 160 mg dose are reported (data cut-off: July 2023).
Results: Pts with axSpA (N=848) had a mean age (standard deviation [SD]) of 40.3 (11.9) years, and pts with PsA (N=1,409) had a mean age (SD) of 49.3 (12.4) years, with a mean time since diagnosis (SD) of 6.1 (7.8) and 7.0 (8.0) years, respectively. Of pts with axSpA, 130 (15.3%) had a history of uveitis; 21 (1.5%) pts with PsA had a history of uveitis. The majority of pts with axSpA were human leukocyte antigen (HLA)-B27 positive (717/848 [84.6%]). In pts with axSpA across the pooled phase 2b/3 axSpA trial data, BKZ exposure was 2,514 PY. Uveitis occurred in 31/848 (3.7%; EAIR [95% confidence interval; CI]: 1.3/100 PY [0.9, 1.8]) pts overall and in 18/130 (13.8%; 4.8/100 PY [2.8, 7.6]) pts with history of uveitis. In pts without a history of uveitis, 13/718 (1.8%; 0.6/100 PY [0.3, 1.1]) pts had uveitis events. [Figure] All events were mild/moderate, one led to treatment discontinuation. Incidence of uveitis in pts with PsA was low across the pooled phase 2b/3 PsA trial data (total BKZ exposure: 3,656 PY); uveitis occurred in three (0.2%; 0.1/100 PY [0.0, 0.2]) pts overall; one had a history of uveitis. No uveitis events led to treatment discontinuation.
Conclusion: Across 2,514 PY in pts with axSpA and 3,656 PY in pts with PsA, the long-term incidence of uveitis in pts treated with BKZ remained low. Previously submitted to: ACR 2024

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How Has Public Interest in Ankylosing Spondylitis, Psoriatic Arthritis, Axial Spondyloarthritis and Uveitis Evolved over Last Two Decades? Results from Real World Data

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Objectives: Novel therapies and diagnostic modalities have emerged for psoriatic arthritis (PsA), ankylosing Spondylitis (AS), axial spondyloarthritis (AxS) and uveitis (Uv) the most common extra-articular manifestation of PsA, AS and AxS, over the last two decades. However, there are no real-world data on how public interest has evolved over this time for these conditions. This information is vital for understanding public awareness. We have identified public interest from 2004-2024 worldwide, in Canada and in US, using Google Trends.
Methods: Google Trends is an online database and analytic tool (Google LLC, CA). It gives random, anonymized samples of actual search results made using Google. Each search query is divided by total search queries for that location and time period to give a ratio. This ratio is scaled from 0-100 with 100 being the maximum interest. "Spikes" are sudden increase in search

interest for a search term. Search for “Ankylosing Spondylitis” in quotation marks includes results for the exact term. Google Trends has 25 search categories and five search types. We have searched for “Ankylosing Spondylitis”, “Psoriatic arthritis”, “Axial Spondyloarthritis” and “Uveitis” from 2004 to 2024 under health category for web search type, worldwide, in Canada and in US. Sensitivity analysis is done by comparing trend in search with “Rheumatoid Arthritis (RA)”.

Results: Public interest in AS, PsA, AxS and Uv has increased from 2004-2024 (Figure). On a ratio scale of 0-100, highest increase in PsA from 25/100 to 75/100 is in US. AS (20/100) and Uv (15/100) have seen a similar increase worldwide, in US and Canada. The term axial spondyloarthritis (AxS) was introduced in 2009 by the Assessment of Spondyloarthopathy International Society (ASAS), reflected in search results. AxS has increased from 0/100 to 60/100 worldwide (since July 2012) and in US (since February 2018). Spikes occur, when a new biologic medication is approved or when public figures announce having these conditions. Spike occurred in July 2020, when FDA approved Secukinumab for non radiographic axial spondyloarthropathy. Sensitivity analysis shows interest in RA is about twice as compared to these conditions. While searches for RA have remained stable, PsA and AxS have seen an almost 50% increase in searches over last two decades.

Conclusion: The increase in web searches suggests an opportunity to educate practitioners and the public about forms of inflammation that are frequently overlooked.

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Primary Care Provider Educational Tool to Improve Osteoarthritis Management in the Primary Care Setting

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Objectives: Osteoarthritis is the most common form of arthritis, and its prevalence is increasing. As a non-inflammatory type of arthritis, it can be managed in the primary care setting with nonsteroid anti-inflammatory drugs, physical and occupational therapy, self-efficacy programs, and orthopedic referral for injections or surgery. At the University of Vermont Health Network, only 1 in 4 patients seen for joint pain have inflammatory arthritis [1], and our wait time for new patients is 9 months. To address unnecessary referrals to rheumatology, we developed and evaluated an educational tool for differentiating non-inflammatory arthritis from inflammatory arthritis to improve provider comfort with managing osteoarthritis.

Methods: We conducted a chart review of adult patients diagnosed with osteoarthritis (n=390) at the University of Vermont Medical Center rheumatology clinic between 2020 and 2022 to gather data on referral patterns and outcomes. We used a pilot survey to assess primary care provider baseline comfort with diagnosing and treating osteoarthritis, which informed the creation of a two-page educational tool. The tool was introduced with a brief education session to primary care providers at 27 of 28 clinics in the network. The utility and impact of the tool was assessed with pre- (n=94) and post-intervention (n=32) surveys at two months.

Results: Osteoarthritis was diagnosed at the first visit in 390 patients referred to rheumatology for joint pain, accounting for 9% of all new patient referrals. Only 5% of these patients were

seen again in rheumatology clinic and only 3% were found to have an inflammatory disease as a primary or concurrent diagnosis. Prior to the introduction of the tool, clinicians were least comfortable with knowing when to refer to rheumatology and most comfortable with diagnosing osteoarthritis. Post-intervention survey data indicated improvement in overall comfort with managing osteoarthritis (8% improvement, p=0.04) and knowing when to refer to orthopedics (10%, p=0.04). Half of clinicians (50%) reported using the tool in their practice, 63% described value in using the tool in medical education, and 43% in shared decision making). After using the tool, 34% anticipate a reduction in referrals to rheumatology and 9% have already referred fewer patients to rheumatology.
Conclusion: We developed and distributed an educational tool to primary care providers. Pre- and post-intervention surveys indicate that this was an effective approach for improving PCP comfort in the diagnosis and management of non-inflammatory joint pain with anticipation of fewer referrals to rheumatology resulting in improved access to care.

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The Impact of Collecting Electronic Patient-Reported Outcomes (Epros) Between Visits on Rheumatological Care: a Scoping Review

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Objectives: To synthesize evidence on the collection of electronic patient-reported outcomes (ePROs) in between visits to guide rheumatology care for patients with inflammatory arthritis (IA) and to evaluate the feasibility, facilitators, and barriers to implementing ePRO-based monitoring in routine practice.
Methods: A scoping review was conducted using Medline and Embase databases with keywords related to “patient-reported outcome measures,” “rheumatology,” and “telehealth.” Primary studies that utilized ePROs in between visits to inform care were included. Two reviewers independently screened and extracted data, which was synthesized narratively, focusing on study characteristics, patient demographics, types of ePROs collected, how ePROs informed care, and facilitators and barriers to integration.
Results: Nineteen studies were included (Table 1). Study designs included randomized controlled trial or intervention design (N=9), qualitative interviews (N=5), proof of concept (N=1), prospective cohort (N=2), cross-sectional (N=1), and observational pilot study (N=1). Sample sizes ranged from 10 to 2111. Most studies came from the Netherlands (N=3), Germany (N=2), China (N=2), USA (N=2), and Denmark (N=2). Studies focused on rheumatoid arthritis (RA) (N=14), ankylosing spondylitis (N=1), systemic lupus erythematosus (N=1) and a combination of RA and spondyloarthritis (N= 3). ePRO integration was found to influence multiple aspects of rheumatological care, including reducing in-person appointments, increasing frequency of medication changes, improving medication adherence, and enhancing patient-

physician communication. Four studies reported better clinical outcomes with ePRO-based monitoring, while four found it to be noninferior to standard care despite fewer in-person visits. Two studies showed no significant improvements in quality of life, medication intensity, or remission rates; one had low adherence due to daily reporting, while the other was conducted in a setting with highly standardized treatment protocols. Key facilitators of ePRO implementation included user-friendly application interfaces (N=7), features supporting patient engagement like medication management tools and personalized reminders (N=5), flexible reporting frequencies (N=3), and ability to skip unnecessary in-person visits (N=3). Identified barriers included increased patient burden due frequent completion of questionnaires (N=3) and lack of physician reimbursement for ePRO review (N=2).
Conclusion: ePROs present promising opportunities to improve clinical outcomes, patient-centered care in rheumatology, and healthcare efficiency by enabling real-time monitoring, promoting self-management, and supporting personalized treatment strategies. However, effective implementation requires a nuanced approach that considers both facilitators and barriers. The findings highlight the need for ongoing collaboration among healthcare providers, patients, and technology developers to address challenges and fully harness the potential of ePROs in enhancing outcomes and efficiency for individuals with IA.

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Sarcopenia as a Feature of Musculoskeletal Manifestations of Pediatric Crohn's Disease

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Objectives: Musculoskeletal (MSK) manifestations are the most common extraintestinal manifestation (EIM) of Crohn's disease (CD), which include arthralgias, axial/peripheral arthritis, enthesitis, tenosynovitis and dactylitis. CD is associated with impaired nutritional status which can lead to unintentional loss of skeletal muscle mass, known as sarcopenia. Few studies report on sarcopenia in pediatric CD, but it is estimated to affect up to one-third of patients and may be associated with more treatment refractory disease and poorer quality of life [1.]. This study aims to investigate the prevalence of sarcopenia in pediatric CD patients with MSK EIM compared to CD patients without MSK EIM and to evaluate CD related clinical outcomes.
Methods: In this single centre, retrospective cohort study, data were collected from 139 newly diagnosed (< 1 year) pediatric CD patients who had undergone magnetic resonance enterography (MRE) at the Children's Hospital, London Health Sciences Center over four years (2019 – 2023). Bowel disease activity was assessed by weighted pediatric Crohn's disease activity index (wPCDAI) scores. Sarcopenia was assessed, by an MSK-trained radiologist, by measuring total psoas muscle area (tPMA) from MRE images and comparing to age and sex matched reference values [2.]. Sarcopenia was defined as a tPMA z-score less than− 2.0. Univariate descriptive statistics were used.
Results: 139 patients with CD were included (mean age 13.1 ± 3.1 years, 59% male). Sarcopenia

was found in 22 patients (15.8%). Children with sarcopenia had higher wPCDAI scores (p=0.033), higher ESR (p=0.035), lower hemoglobin (Hb) (p<0.001) and a higher number of hospital admissions (p=0.041) compared to children without sarcopenia. Fifty-two children (37.4%) had MSK EIM. Among the 52 patients with CD-MSK EIM, 7 had sarcopenia (13.5%) [Table 1]. No statistically significant difference was found in the prevalence of sarcopenia in patients with MSK EIM compared to CD-alone (17.2%) (p=0.555). Only 15.8% (22/139) of the total cohort and 40% (21/52) of the MSK-EIM group had seen a rheumatologist.
Conclusion: Initial findings from our study demonstrate that 13.5% of children with CD who have MSK EIM have sarcopenia. At baseline, patients with CD related sarcopenia did demonstrate higher bowel disease activity, increased admissions to hospital and more systemic inflammation (higher ESR, lower Hb). Limitations of this study include the lack of systematic rheumatology assessment of CD patients for MSK EIM, resulting in potential under-reporting of MSK-EIM. Further analyses are planned to evaluate the impact of sarcopenia on bowel disease outcomes over time in both groups.

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Cardiovascular Disease Incidence Among Aging Patients with Rheumatoid Arthritis: Results from the Canadian Longitudinal Study on Aging (Clsa)

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Objectives: Rheumatoid arthritis (RA) is an autoimmune inflammatory arthritis associated with a high risk of cardiovascular disease (CVD). This study examined incidence of CVD in individuals with and without RA and assessed the role of potential risk factors in this association.
Methods: Data were obtained from the Canadian Longitudinal Study on Aging (CLSA) database. Incidence rate ratios (IRR) for CVD were calculated to compare the CVD incidence among RA and non-RA individuals. Cox proportional hazard regression models were used to identify potential risk factors associated with CVD incidence in this population. Stratification based on sex, age and education levels were conducted.
Results: A total of 553 RA cases and 19,291 controls were included in the analysis. The study population was 54% females and had a mean age of 60.9 (± 9.4) years. RA patients experienced significantly higher CVD incidence, compared to non-RA individuals (IRR = 1.69, 95% CI: 1.34 – 2.11). Multivariable analysis (Table 1) identified several risk factors associated with increased CVD incidence, including RA, elevated C-reactive protein (CRP) level, disease-modifying antirheumatic drugs (DMARDs) other than methotrexate, male sex, older age, low physical activity, smoking, dissatisfaction with sleep quality, diabetes, hypertension and mood disorder. Age-stratified analysis showed RA had a more profound effect on increasing CVD among younger individuals (HR in < 65 years old: 1.99, 95% CI: 1.28 – 3.01) than older individuals (HR is >64 years old: 1.81, 95% CI: 1.02 – 2.97). Sex-stratified analysis revealed that RA was only a risk factor for CVD among females (HR: 2.11, 95% CI: 1.37 – 3.26), while DMARDs were only found to increase the CVD risk in males (HR: 3.28, 95% CI: 1.00 – 11.5). Lastly, RA was found to be associated with higher CVD incidence only among individuals with lower education levels (low education: HR = 3.5, 95% CI: 2.01 – 6.09,

high education: HR= 1.33, 95% CI: 0.85 – 2.08).
Conclusion: This study showed that RA is independently associated with an increased risk of CVD. Additionally, sex, age and education level were effect modifiers in the relationship between RA and CVD incidence. Future research should focus on environmental factors such as air pollution and other RA-related factors such as autoantibodies and advanced therapies to assess their relationship with CVD incidence.

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A Scoping Review of Outcomes and the Quality of Studies of Adults with Childhood-Onset Systemic Autoimmune Rheumatic Diseases

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Objectives: To assess reported outcomes of adults with childhood-onset systemic autoimmune rheumatic diseases (ChildSARDs), including systemic lupus erythematous (SLE), idiopathic inflammatory myositis (IIM), systemic sclerosis (SSc), Sjogren syndrome (SjS) and systemic vasculitis (SV).
Methods: With a librarian, we developed a peer-reviewed search strategy using MEDLINE and Embase for English articles (1 January 1990 to 30 June 2023). We tested our searches against 26 known articles on ChildSARD adult outcomes to verify search coverage. Childhood-onset of disease was defined by authors (<14-18 years old). Studies with mixed populations (e.g. adolescent-adult, childhood, adult onset) were excluded if: i) >50% of the sample were still children at final assessment, ii) ChildSARD adult outcomes were not reported separately. Studies were graded for risk-of-bias using the Quality in Prognosis Studies (QuiPS) tool. Two reviewers independently graded the studies before meeting to reach consensus. Any disputes were resolved by a third reviewer (LL).
Results: The search identified 6848 papers, of which 40 met study criteria. No study meeting criteria was published before 2000, 4 (10%) between 2001-2010, 24 (60%) between 2011-2020, and 12 (30%) between 2021-2024. Most studies were conducted in Europe (33%) and the United States (28%). 60% of studies were in SLE, 25% IIM, 8% SSc, 5% SV, and 0% SjS. The majority of publications were cross-sectional in design (68%). Mean disease duration ranged from 5.5-23.9 years. Mean follow-up duration of longitudinal studies ranged from 7.6-14.2 years. The most common reported outcomes were accumulated damage (25%), mortality (23%), and disease activity (18%). QuiPS identified a moderate to high risk-of-bias in the following domains: 95% of study participation, 92% of study attrition (N=13, non-cross-sectional studies), 40% of prognostic factors, 70% of outcomes, 95% of confounding, and 73% of statistical analysis.
Conclusion: There is growing interest in adulthood outcomes of ChildSARDs, as seen in the increasing number of publications. However, the majority of studies demonstrated moderate to high risk-of-bias. Most studies used cross-sectional study designs, which limits robust assessment of prognostic factors. Readers should be aware of design limitations of interpreting results from current studies. Investigators planning studies of adult outcomes of ChildSARDs should consider bias reduction measures during the design stage and acknowledge limitations where biases cannot be substantially reduced.

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Comparing Immunogenicity with Protein Subunit and mRNA COVID-19 Vaccines in Patients with Rheumatic Diseases on Rituximab (COVBIRD Study)

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Objectives: Treatment with rituximab for systemic autoimmune rheumatic diseases (SARD) increases morbidity and mortality following COVID-19 infection [1], and reduces antibody responses to vaccination. We evaluated humoral responses following fourth or fifth doses of either a protein subunit (PSV) or messenger RNA (mRNA) vaccines.

Methods: We recruited adults with SARDs on rituximab post-third or fourth mRNA COVID-19 vaccine in an open label, non-randomized, comparative trial. Participants chose to receive either a fourth dose of mRNA (Spikevax®) or PSV (NuvaxovidTM) vaccines. Patients who already received a fourth dose of mRNA vaccine were offered PSV as their fifth dose. Humoral vaccine-responses were determined pre, 28 days and 6 months post-vaccination. Plasma and sera were evaluated for anti-receptor binding domain (anti-RBD) by ELISA, and for neutralizing antibodies to Wuhan pseudotyped lentiviruses. We used descriptive statistics for demographics and ANOVA for immunogenicity.

Results: We studied 86 participants with rheumatoid arthritis (39%), ANCA vasculitis (32%), idiopathic inflammatory myositis (9%), systemic lupus erythematosus (8%), systemic sclerosis (7%), and undifferentiated SARDs (4%). Mean (SD) age was 57.3 (15.3); 73% were female; 91% White; 23% were on prednisone, 21% on antimalarials, and 42% on other immunosuppressors. Of those receiving a fourth dose (N=49) more chose Spikevax® (n=35)

than NuvaxovidTM (N=14); 37 participants chose NuvaxovidTM for their fifth dose. An increase of anti-RBD response at 28 days post-vaccination was present in those receiving a fourth dose mRNA vaccine, but not in those receiving fourth dose PSV (Figure 1). In those receiving fifth dose PSV, anti-RBD titers decreased at six months when compared to those at 28 days, while anti-RBD remained high in fourth dose mRNA recipients. The fourth dose mRNA recipients had higher neutralization titers against the Wuhan strain at 28 days compared to their pre-vaccination titers; this was not observed after the fourth dose of PSV. For all groups, the neutralizing response significantly decreased at 6 months post-vaccination compared to day 28. **Conclusion:** In SARDs patients on rituximab, both fourth and fifth dose PSV vaccine recipients had decreased anti-RBD titers at 6 months, while post fourth dose mRNA recipients increased their anti-RBD up to 6 months post-vaccination. Overall, humoral response in mRNA vaccine recipients seemed superior to those receiving PSV. This emphasizes the importance of thorough evaluation of new COVID-19 vaccines in the immunocompromised.

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Safety of Covid-19 Boosters in People with Systemic Autoimmune Rheumatic Diseases on Rituximab (Covbird Study).

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Objectives: People living with systemic autoimmune rheumatic diseases (SARD) on B-cell depletion agents have impaired immunogenicity and increased vulnerability to severe COVID-19. We assessed the 7-day solicited reactogenicity and safety of booster doses following

COVID-19 vaccine primary series.
Methods: We recruited adults with SARDs on rituximab post-third or fourth dose of a messenger RNA (mRNA) COVID-19 vaccine in an open label, non-randomized, comparative trial. Participants chose to receive either a fourth dose of mRNA Spikevax® or NuvaxovidTM, a protein subunit vaccine (PSV). Patients who had already received a fourth dose of mRNA vaccine were offered the PSV as their fifth dose. From study entry, up to 180 days post-booster, subjects self-reported solicited 7-days reactogenicity, and unsolicited adverse events, adverse events of special interest (AESI) (defined as medically confirmed flares of the underlying SARD), new COVID-19 infections, and serious adverse events (SAEs) (requiring hospitalization). We used descriptive statistics for demographics and Chi square tests to report reactogenicity and adverse events.
Results: We recruited 86 participants with rheumatoid arthritis (39%), ANCA vasculitis (32%), idiopathic inflammatory myositis (9%), systemic lupus erythematosus (8%), systemic sclerosis (7%), and undifferentiated SARDs (4%). Mean (SD) age was 57.3 (15.3); 73% were female; 91% White; 23% were on prednisone, 21% on antimalarials, and 42% on other immunosuppressors. The most significant reactogenicity manifestations were fever, erythrema, swelling and pain. The proportion of side effects for all types of AEs were similar comparing the fourth-dose mRNA versus the fourth-dose PSV, and the fourth-dose PSV versus the fifth-dose PSV. Fever was only present in the fourth-dose mRNA group; erythema and swelling were reported more often in fifth-dose PSV vs fourth-dose mRNA; and pain significantly more in fourth-dose mRNA versus 5th-dose PSV. Disease flares (N=3, occurring at 14, 92, and 131 days) are presented in Table 1, along with COVID-19 and other infections (N=6). Including infections, there were nine SAEs experienced by eight participants (Table 1). There were no deaths.
Conclusion: Three of 86 patients experienced a disease flare and nine others required hospitalization, most for COVID-19/other infections. A fourth or fifth booster dose of either an mRNA or a PSV vaccine were not clearly associated with unexpected vaccine reactions in rituximab-treated SARD patients. Revaccination of patients on rituximab with either mRNA or PSV vaccines appears safe.

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Prescription of Herpes Zoster Vaccine for Immunocompromised Rheumatoid Arthritis Patients in Routine Rheumatology Care

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Objectives: Immunocompromised patients are at higher risk of herpes zoster (HZ)1-3. The recombinant zoster vaccine was approved in Canada in 2017 and as of May 2023 it is free for individuals ≥75 years, and for immunocompromised individuals aged ≥18 in Quebec. This study aims to determine the vaccination rate in rheumatology care and identify patient characteristics associated with vaccination.
Methods: A retrospective chart review of consecutive rheumatoid arthritis (RA) patients with a visit between January 2023 and October 2023 at the Hôpital Maisonneuve-Rosemont was performed. Demographics, comorbidities, current immunomodulating agents, corticosteroids use,

previous HZ episode and vaccination status were documented. Patients on no immunomodulating agents or hydroxychloroquine monotherapy were excluded. Descriptive statistics were used. P-value ≤ 0.05 was considered significant.
Results: A total of 251 patients were included. Of those,184 (73.3%) were female, mean age was 66.6 ± 14.5 years and 15 (6.0%) patients had a previous HZ episode. Throughout the study period, 155 (61.8%) were exposed to methotrexate, 66 (26.3%) to other csDMARDs, 75 (29.9%) to a biologic agent (48 anti-TNF, 22 other biologics and 5 rituximab) and 15 (6.0%) to a JAK inhibitor. A total of 65 (25.9%) were vaccinated either prior or throughout the study period and 186 (74.1%) patients remained unvaccinated. Among vaccinated patients, 28 (43.1%) received it after the implementation of the provincial gratuity program. Exposition to corticosteroids was present in 17.1%, with a mean cumulative dose of 990.0 ±1036.6 mg in the non-vaccinated group vs 525.6 ± 614.3 mg in the vaccinated group ($p<0.01$). When comparing subjects receiving vaccination to those who remained unvaccinated, a higher proportion of patients on anti-TNF (27.7% vs 16.1%; $p=0.04$), other biologics (16.9% vs 5.1%; $p<0.01$) and JAK inhibitors (15.4% vs 2.7%; $p<0.01$) were vaccinated. No difference was seen between other immunomodulating agents. A total of 21.9% vaccinated and 64.1% unvaccinated patients were ≥50 years old ($p=0.70$) and 6.8% vaccinated and 24.3% unvaccinated patients were ≥75 years old ($p=0.32$). No differences were observed between age and medication subgroups in vaccination timing relative to the provincial gratuity program's implementation.
Conclusion: Only a quarter of eligible RA patients received HZ vaccination during routine rheumatology care. It was administered more frequently in patients on advanced therapy, but not on those with other immunomodulating drugs or traditional risk factors. Public health measures should be strengthened to promote vaccination among at-risk populations and rheumatologists should offer adequate counselling on vaccination.

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Pulmonary Fibrosis with Autoimmune Features and Sjögren's Syndrome

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Objectives: This retrospective study aims to compare the characteristics and outcomes of patients with interstitial lung disease (ILD) who have Sjögren’s syndrome-associated antibodies (SjS-aAb), with or without a diagnosis of Sjögren's syndrome (SjS).
Methods: Patients evaluated at the CHUM ILD clinic with at least one SjS-aAb were included in

the study. They were classified as having SjS if they met the 2016 ACR-EULAR criteria. Patients without SjS were further stratified as interstitial pneumonia with autoimmune features (IPAF) and non-IPAF, based on the 2015 ERS/ATS criteria[1]. ILD progression was defined according to OMERACT[2] and ATS/ERS/JRS/ALAT[3] guidelines.
Results: A total of 41 patients with SjS, 21 with IPAF, and 26 with non-IPAF were identified. Mean age was 71 years and 85% were White. Non-IPAF patients were more frequently men (62% vs 35%, p=0.03) with a smoking history (88% vs 60%, p=0.21) and usual interstitial pneumonia (UIP) radiologic pattern (81% vs 24%, p=0.08). SjS patients more frequently had xerophtalmia (64% vs 17%), xerostomia (55% vs 38%), anti-SSA/Ro (84% vs 35%), anti-SSB/La (32% vs 18%) and very strongly positive anti-Ro52 aAb (76% vs 40%). ILD severity was similar across groups. Immunosuppressants were used in 68%, 44% and 29% of SjS, IPAF and non-IPAF. Over a mean follow-up of 3.5 years, ILD progression was observed in 41-49% of patients and similar across groups. However, non-IPAF patients more frequently became oxygen-dependent (58% vs 34%). Lung transplants were required in 2%, and 14% died of pulmonary causes. Progressors more frequently used immunosuppressive drugs (69% vs 43%).
Conclusion: In this population with SjS-aAb, ILD progression was similar irrespective of SjS diagnosis and IPAF classification. Further study is required to identify predictors of progression while accounting for the effect of treatments and confounding by indication. *Drs Hoa and Landon-Cardinal contributed equally to this abstract.

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Cardiovascular Risk Assessment and Management in a Systemic Sclerosis Cohort: A Quality Improvement Initiative

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Objectives: Macrovascular atherosclerotic disease is a major cause of mortality in systemic sclerosis (SSc). We aimed to examine the current quality of cardiovascular risk assessment and management amongst patients with systemic sclerosis (SSc), to identify gaps in risk management that could be optimized.
Methods: SSc patients with no coronary artery disease (CAD) history followed in a clinical practice at the CHUM in the past two years were included. A retrospective chart review was performed to extract variables required to calculate the Framingham Risk Score (FRS) and the QRISK3 score. Patients with a lipid screening done in the last 5 years (if FRS <5%) or in the last year (if FRS ≥5%) were classified as having adequate lipid screening based on FRS guidelines, whereas all patients ≤ 40 years and patients older than 40 years with a lipid screening done in the last year were classified as having adequate lipid screening according to QRISK3 guidelines. Family history of CAD was assumed negative when missing. Characteristics associated with inadequate risk assessment and high FRS risk of cardiovascular events were evaluated using Student's t tests and Fisher's exact tests.
Results: A total of 61 SSc patients were evaluated (mean age 63 years, 92% female, 77% White, 22% diffuse SSc, 2% diabetes). Lipid screening was inadequate in 39% of patients, more frequently adequate among patients with family medicine follow-up (67% vs 36%, p=0.03), and numerically more often female (63% vs 40%, p=0.36) and White (67% vs 38%, p=0.10) using

FRS. FRS and QRISK3 scores were estimated for 51 and 59 patients respectively. Around half (47% and 53%) of patients were classified as low risk based on FRS and QRISK3. Patients with high FRS (8/51) were older (mean age 71 vs 57 years, p=0.01) and numerically more often male (13% vs 0%, p=0.25), White (100% vs 74%, p=0.30), current smokers (25% vs 0%, p=0.06), with body mass index ≥25 (100% vs 36%, p=0.08) and systolic blood pressure ≥140mmHg (57% vs 0%, p=0.003). Finally, 84% of moderate-risk and 100% of high-risk patients did not achieve the lipid target according to FRS guidelines.
Conclusion: In this quality improvement project, nearly 40% of patients did not have adequate lipid screening and a high proportion of patients with moderate/high risk profiles did not meet lipid targets. Rheumatologists should consider evaluating or referring for cardiovascular risk assessment and management, especially in patients without family medicine follow-up.

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Immunosuppressive Therapies for Diffuse Systemic Sclerosis: A Scoping Review

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Objectives: Systemic sclerosis (SSc) is a progressive autoimmune disease characterized by significant multi-organ damage. Its intricate pathophysiology involves various immune pathways, including the activation of B-cells, which are thought to play a crucial role in disease progression by driving fibrosis and causing vascular damage [1]. Historically, treatment options were limited; however, a larger range of treatments targeting the immune system have been tested over the last decade, including CAR-T therapy [2], a treatment modality that Ottawa is working towards in collaboration with the CLIC pan-Canadian CAR-T network [3]. We conducted a scoping review to summarize trends of immunosuppressive therapies used for SSc treatment, particularly relating to skin and lung involvement.
Methods: A scoping review was conducted in adherence to the PRISMA-ScR methodology. We searched three databases (MEDLINE, EMBASE, Cochrane Central) for studies published from January 2004 to January 2024. Titles and abstracts, then full-text articles were screened, focusing on skin and lung function outcomes in SSc.
Results: A total of 3891 abstracts were screened, resulting in the inclusion of 294 studies –149 abstracts and 145 full-text articles. Overall, 41 unique therapies studied were identified. The ten most commonly studied treatments were: rituximab (n=84, 20.6%), cyclophosphamide (n=77, 18.9%), mycophenolate mofetil (n=52, 12.8%), autologous hematopoietic stem cell transplantation (autoHSCT) (n=29, 7.1%), tocilizumab (n=23, 5.7%), glucocorticoids (n=23, 5.7%), azathioprine (n=19, 4.7%), methotrexate (n=14, 3.4%), imatinib (n=14, 3.4%), and nintedanib (n=10, 2.5%). The peak number of studies pertaining to cyclophosphamide (28.9%) and mycophenolate mofetil (17.4%) treatments occurred in 2014-2018. However, from 2019-2024, studies of rituximab (27.2%) and autoHSCT (11.3%) became more prevalent.
Conclusion: Over the past two decades, SSc treatment has progressed significantly, shifting between immunosuppressive agents and autoHSCT. These advancements highlight the evolving

landscape of SSc management and emphasize the need for innovative approaches, including advanced cellular therapies such as CAR-T-based treatments.

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Mitochondrial Dysfunction in Systemic Sclerosis

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Objectives: Systemic sclerosis (SSc) is a chronic inflammatory and fibrotic disease with the involvement of skin at its onset. Although numerous pathogenic processes contribute to SSc, its root cause remains poorly understood. We hypothesize that valuable insights into SSc pathogenesis can be gained by characterizing interactions between functional niches within the skin from SSc patients using spatial transcriptomics. We aimed to: 1. To identify and map functional zones in SSc skin based on their cellular composition and patterns of mRNA expression. 2. To objectively designate dominant molecular signatures and pathways to those discrete dermal zones using bioinformatic tools.

Methods: Skin biopsies from 11 patients with limited and diffuse cutaneous SSc were analyzed using spatial transcriptomic sequencing. Single-cell RNA sequencing (scRNA-seq) [1] were used to deconvolve dermal cell types. Sequencing reads were processed using Space Ranger and Cell Ranger pipelines. Clustering of spatial and single-cell data was performed with Seurat. Identified clusters were annotated by differentially expressed genes, with functional enrichment analysis conducted using GO and KEGG pipelines via ClusterProfiler.

Results: Spatial transcriptomic analysis identified six distinct transcriptomic clusters spanning the dermis in an interwoven pattern not aligned with the histological layers of the skin. We focused on three major dermal clusters (designated as clusters 0, 1, and 4) comprising >90% of the dermal area. Cluster 0 was heterogeneous with respect to cell types, included inflammatory signature, and was functionally dominated by mitochondrial metabolic pathways. Cluster 1 contained mostly fibroblasts exhibiting fibrotic pathways with minimal inflammation. Cluster 4 represented perivascular areas with prominent smooth muscle cells and myofibroblast signatures. The mitochondrial gene dysregulation in cluster 0 showed downregulation of nuclear DNA-encoded mitochondrial genes and upregulation of mitochondrial DNA-encoded genes, indicating stress-adaptation mechanisms in this functional zone. In contrast, Cluster 1 exhibited downregulation of both nuclear and mitochondrial genes - suggesting complete collapse of mitochondrial function.

Conclusion: For the first time, we revealed discrete zones in SSc skin characterized by inflammation accompanied by mitochondrial stress, separated from the areas of fibrosis where the mitochondrial function was disintegrated. Our study supports previous research indicating that dysregulated mitochondria are central, if not fundamental, to the pathogenesis of SSc.

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Is There Relevance of a Positive Rheumatoid Factor in Systemic Sclerosis? a Systematic Review of the Literature.

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Objectives: Objectives: The purpose of this review was to determine the relevance of a positive Rheumatoid Factor (RF) in Systemic sclerosis (SSc). SSc is a rare autoimmune disease characterized by vasculopathy, fibrosis and autoantibodies. As high as 30% of those with SSc are rheumatoid factor (RF) positive, however the relationship between RF and various manifestations of SSc are not fully described.

Methods: Methods: A literature search was performed on PubMed, Embase, CINAHL, and Cochrane using the following search terms: systemic sclerosis, rheumatoid factor, and scleroderma. Articles associated with RF in SSc were reviewed.

Results: Results: Rheumatoid arthritis prevalence is slightly increased in SSc (3%). However, if there is not an overlap with RA, RF does not seem to predict joint manifestations, arthritis or arthralgia in SSc. In addition to SSc-RA overlap syndrome, RF may be a predictor for SSc overlapping with Sjogren's disease (SSc-SS). It is uncertain as to whether RF is protective for SSc-ILD. RF does not seem to predictive of other well-known serological markers of SSc, such as anti-topoisomerase antibodies, anti-centromere antibodies or Ro52/Trim21, however RF may be associated with elevated ESR or CRP levels. In terms of skin manifestations, individuals with elevated IgA-RF have increased likelihood of having a dcSSC subtype, telangiectasias and digital pitting scars. Evidence is lacking in SSc and RF with respect to other organ manifestations, such as heart and kidney.

Conclusion: Conclusions: Further examination is warranted to understand the role of RF in SSc

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Improving Triage Accuracy of Unclear Rheumatology Referrals: a Quality Improvement Study

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Objectives: Patients with early inflammatory arthritis (EIA) need to be seen urgently to initiate treatment. Our community rheumatology clinic in Ontario, Canada was concerned that EIA cases may be delayed unnecessarily if referrals lacked sufficient detail to triage accurately. In a prior quality improvement project, we redesigned our triage process to include a patient survey (the "EIA Tool"), which was validated to identify referrals with EIA. In this study, we aimed to evaluate the sensitivity and specificity of the new triage process for referrals with unclear urgency after 12 months of use.

Methods: All referrals accepted by one rheumatologist were included from April 2020-July 2022. During the intervention period, we implemented the new triage process. The rheumatologist triaged all referrals as urgent, non-urgent, or unclear. Patients with unclear urgency were asked to complete the online EIA Tool (Figure 1) prior to scheduling. Their survey

result determined a triage score of urgent or non-urgent, and consultations were scheduled accordingly. Post-consultation, the rheumatologist determined the 'true' urgency score, while blinded to the pre-consultation score. Data were collected prospectively on all incoming referrals. We analyzed the data using descriptive statistics and calculated the sensitivity and specificity of the baseline and new triage processes.
Results: The 16-month baseline period (April 2020 to July 2021) included 1296 referrals; 647 (50%) were triaged as urgent. The 12-month intervention period (August 2021-July 2022), included 888 referrals; 508 (57%) were triaged as urgent, and 97 (11%) were triaged as unclear. The EIA tool was completed in all unclear cases; 93 patients submitted the survey online, and 4 patients without email completed the survey by phone. Most patients (86%) completed the survey within 1 day of receiving it. Unclear cases had a cycle time from referral to scheduling of 5 days, compared to 3 days for those who were not sent the EIA tool. The sensitivity to identify urgent cases was 97% during the intervention versus 85% at baseline. The specificity during the intervention was 59% versus 70% at baseline.
Conclusion: The EIA Tool helped us detect 97% of truly urgent cases, thereby reducing the risk of delayed treatment caused by triage error. We have since spread this process to four rheumatologists in our clinic. Our next step is to analyze urgent referral volume using statistical process control charts, in order to modify our scheduling algorithm. **Supported by a CIORA grant**

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Rheumatology Rapid Access Clinic: An Accelerated Access Model of Care

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Objectives: The Canadian healthcare system is well-regarded for its dedication to provide equitable care to all residents. Despite this commitment, concerns about wait times and access to care prevail, especially for patients transitioning from primary to specialized care1. In particular, wait times for rheumatology consultation can be lengthy 2. In Ontario, the average wait time for assessment of suspected inflammatory arthritis is 74 days, far exceeding the benchmark target of 4 weeks 3. Key drivers of longer wait times include the incongruity between rheumatology workforce supply and demand, which is further exacerbated by the increasing volume of patients. The lack of access to timely rheumatology consultation is predicted to worsen in the coming years2. To address this gap in access, a Rheumatology Rapid Access Clinic (RAC) led by an Advanced Clinic Practitioner in Arthritis Care (ACPAC) trained extended role practitioner (ERP) was established at Mount Sinai Hospital (MSH). A quality improvement project was undertaken to assess the impact of the RAC on timely access to care, reduction of emergency department readmissions, and the identification of diagnostic frequencies and subsequent absorption into the hospital's Rheumatology Division.
Methods: Patients presenting to the MSH Emergency Department (ED) or Family Health Team (FHT), with suspected or confirmed rheumatologic conditions, as diagnosed by the attending practitioners/physicians, were referred to the RAC based on clinical need for expedited care. An ERP conducts a comprehensive assessment, including referring for appropriate laboratory tests and imaging per established medical directives. Thereafter, a treatment plan is initiated in

collaboration with the attending rheumatologist.
Results: During the 10-month project period (September 2023 to July 2024), the RAC assessed a total of 96 patients. Of those referred, 94.1% attended their appointments. The majority of patients were female (59.4%). The average patient age was 50.0 years. The average time from referral to the initial appointment was 9.6 working days. Approximately 9.3% of the patients returned to the MSH ED with 3 patients re-referred from the RAC for medical concerns. Gout was the most frequently assessed condition, accounting for 18% of cases. 56% of the patients were integrated into the rheumatologists' practice for ongoing care.
Conclusion: A Rheumatology RAC led by an ACPAC trained ERP facilitated timely and effective assessment and treatment planning for patients referred from primary or emergent care. This approach has the potential to optimize outcomes and could serve as a model for similar settings facing challenges with access to care.

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The Advanced Clinician Practitioner in Arthritis Care Contributions to the Scientific Literature: A Scoping Review

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Objectives: The Advanced Clinician Practitioner in Arthritis Care (ACPAC) program prepares experienced health professionals (physiotherapists, occupational therapists, nurses and chiropractors) in the advanced assessment and management of rheumatic and musculoskeletal disease. Since the inception of the program, graduates have participated in health research and program evaluation. The aim of this study is to describe the peer-reviewed literature regarding ACPAC clinicians, the ACPAC program and literature authored by ACPAC graduates and/or program leadership.
Methods: A PRISMA-compliant scoping review was conducted to explore the above aim. Ovid Embase, Ovid MEDLINE and Web of Science were searched from June 2006 (first ACPAC Program cohort) to June 2023. English-language studies of any design were included if they mentioned the ACPAC Program, ACPAC clinicians and/or were authored by an ACPAC graduate and/or program leadership. Four reviewers (JH, LC, KW, LP) independently screened titles and abstracts according to pre-established criteria. Next, reviewer pairs conducted full-text reviews and extracted data from the selected publications. Conflicts were resolved by consensus amongst the investigative team. Descriptive statistics characterized the literature according to authorship, publication type, and study design. Articles were evaluated for factors of health equity using the PROGRESS-Plus framework.
Results: Of 5987 articles retrieved and screened, 106 were included for analysis. Of these, 85.9% were authored by an ACPAC graduate. 42.4% of the articles mentioned the word "ACPAC". Most articles were published in rheumatology/arthritis focused journals (37.7%), followed by physiotherapy journals (14.2%). First authorship was observed in 21.5% of included articles, followed by 72% where ACPAC graduates were contributing author(s). Most ACPAC authors were affiliated with a healthcare institution (78.9%). Journal impact factor (JIF) ranged from 0.297 (Physiotherapy Quarterly) to 96.2 (New England Journal of Medicine), with an

average JIF of 4.55 (SD 12.67). Over the data capture period, the year 2018 had the most publications per annum (n=18), with an average of 5-6 articles published per year. Observational (44.4%) and qualitative (25.6%) study designs were most frequently published. Rheumatic diseases (56.5%) and orthopaedics (21.7%) were the most common areas of study. Evaluation of health equity factors revealed little mention of data collection related to race/ethnicity/culture/language, religion, social capital or socioeconomic status.
Conclusion: This scoping review demonstrates substantial contributions to the scientific literature by ACPAC graduates and program leadership in the study of rheumatic disease and orthopaedics. Future consideration for ACPAC-related scientific enquiry include expansion of study design (e.g. controlled studies, systematic reviews) with conscious inclusion of health equity in study methodology.

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Knowledge Acquisition Related to Rheumatic and Musculoskeletal Diseases Amongst Advanced Clinician Practitioner in Arthritis Care Graduates: a Retrospective Review

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Objectives: Objectives: The Advanced Clinician Practitioner in Arthritis Care (ACPAC) Program is a post-licensure competency-based academic program that educates experienced physiotherapists, occupational therapists, nurses, and chiropractors, in the advanced assessment and management of rheumatic and musculoskeletal diseases (RMDs). Since the inception of the ACPAC program in 2005, the curricular content has evolved, based on current evidence and changing health system needs. The purpose of this study was to determine overall knowledge acquisition of ACPAC program learners from 2022 to 2024 with respect to core clinical competencies and disease categories for RMD practice.
Methods: Methods: This retrospective study evaluated pre-program and post-program written examination scores for ACPAC program graduation cohorts 2022-23 and 2023-24. Paired clinical case-based written examination scores were obtained through the Office of Continuing Professional Development, Temerty Faculty of Medicine, University of Toronto. Scores reflected the curriculum competencies including pathological features of RMD; differential diagnosis of RMD; investigation interpretation (laboratory and imaging), pharmacotherapy, triage and management, and disease category. Wilcoxon signed-rank tests were used to determine change in pre-program test scores to post-program test scores.
Results: Results: Over the 2-year study period, 21 learners (17 physiotherapists; 3 occupational therapists; and 1 chiropractor) graduated from the ACPAC program. On average they had 14.8 years post-licensure experience in their respective professions. Geographical distribution was as follows: Central/Southern Ontario (n=17); Northern Ontario (n=2); Quebec (n=1); and Ireland (n=1). We calculated pre- and post-program paired scores across a number of competencies. Overall knowledge improvement from beginning to end of program based on written scores was

35.3% (p<0.001). Significant improvement in knowledge for clinical competencies was also demonstrated including pathological features of RMD: 34.2% (p<0.001); differential diagnosis of RMD: 43.2% (p<0.001); imaging interpretation: 32.6% (p<0.001); laboratory interpretation: 29.0% (p<0.001); pharmacology: 37.6% (p<0.001); and triage/management: 32.6% (p<0.001). Knowledge acquisition related to disease categorization revealed adult inflammatory arthritis: 34.0% (p<0.001); systemic autoimmune rheumatic diseases: 33.2% (p<0.001); paediatric musculoskeletal: 31.0% (p<0.001); monoarthritis: 38.2% (p<0.001); and orthopaedic: 60.2% (p<0.001).
Conclusion: Conclusions: Knowledge acquisition, related to RMDs, amongst experienced clinicians enrolled in the ACPAC Program was significant across all competencies and disease categories addressed in the rigorous competency-based curriculum. With measured changes in overall knowledge, specific curricular competencies, including acquired knowledge for triage and management, ACPAC Program graduates have the potential to address emerging unmet RMD health system needs by adopting extended scope roles.

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A Scoping Review of Approaches to Treat Juvenile Idiopathic Arthritis Symptoms to Inform the Expanded Version of the Jia Option Map

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Objectives: Young people with juvenile idiopathic arthritis (JIA) experience physical and psychological symptoms that negatively impact functional activities. Our team previously developed the JIA Option Map, a web-based patient decision aid to support decision-making for JIA pain management. Qualitative work identified a need to expand the JIA Option Map to include ways to manage symptoms beyond pain, such as fatigue, stiffness and mental health

symptoms (e.g., stress and anxiety), and provide tips to participate in meaningful activities. To inform the expansion of the JIA Option Map, we summarized the evidence for approaches to manage JIA symptoms.
Methods: We conducted a scoping review following the Arksey and O'Malley framework. We assembled a research team comprised of people with lived experience, health care providers and researchers, and searched major databases for clinical practice guidelines (CPGs) which included systematic reviews (SRs), SRs and randomized controlled trials (RCTs) of approaches for arthritis-symptom treatment other than approaches aimed primarily at reducing disease activity such as disease-modifying anti-rheumatic drugs. We included approaches that can be used in addition to arthritis treatment to manage pain, stiffness, fatigue and mental health in JIA compared to any control group from database inception to September 2024. We extracted study information including effectiveness and safety of approaches. We assessed the methodological quality of the studies using the Appraisal of guidelines for research and evaluation II (AGREE II), Assessing the methodological quality of systematic reviews 2 (AMSTAR 2) and the Cochrane Risk of Bias 2.0, as well as the strength of evidence using Grading of Recommendations Assessment, Development, and Evaluation (GRADE).
Results: We included a total of five CPGs, nine SRs and 43 RCTs. We found evidence for splints and orthoses, massage, low-energy laser therapy, various physical activity interventions such as therapeutic exercises and pilates, educational programs and self-management interventions using cognitive behavioural therapy, as well as non-steroidal anti-inflammatory drugs (NSAIDs). Both pharmacological and non-pharmacological approaches were effective although most studies were of low or moderate quality.
Conclusion: This scoping review shows that a wide variety of approaches are effective in improving JIA symptoms although there is a need for more high-quality studies. Efforts are underway to present this evidence to young people with JIA and parents/caregivers, HCPs and researchers to agree on the information to add to the expanded JIA Option Map. **Supported by a CIORA grant**

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How Are Determinants of Health Inequities Related to Decision-Making in Juvenile Idiopathic Arthritis Care? a Narrative Synthesis

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Objectives: To make high-quality decisions about juvenile idiopathic arthritis (JIA) treatments, youths and their caregivers should receive information about treatment options, explore which

benefits and harms matter most to them, and consider their preferences and values. Shared decision making (SDM) allows youths, their caregivers and health providers (HCPs) to make high-quality decisions. Our team previously explored decisional needs in JIA, but no studies have summarized how determinants of health inequities are related to decision-making in JIA. We aimed to summarize how determinants of health inequities are related to decision-making in studies exploring decisional needs in JIA.
Methods: We systematically searched Medline, Embase and PsycInfo from database inception to September 2024 for studies assessing decisional needs in JIA from the perspectives of youths with JIA, their caregivers and HCPs. Two team members independently screened citations and extracted data by examining excerpts narratively. We extracted data related to decisional needs and determinants of health inequities inspired by the Campbell and Cochrane Equity Methods Group's PROGRESS-Plus framework (sex, gender, cultural factors, sociodemographic factors, education level, place of residence, occupation, religion, and social capital).
Results: We found 4297 records and included 80 studies. While most studies recorded determinants of inequities among participants (n=73), few explored the links between these determinants and decision-making in JIA (n=16), with five studies examining links with sex and gender, five with cultural factors, two with sociodemographic factors, three with education level and two with place of residence. Three studies looked at the use and interest of complementary health approaches among young people with JIA and found no links with sex, gender, race, or maternal education. A study found different treatment preferences according to gender. Three studies showed the influence of cultural factors on treatment decisions in JIA: HCPs took the patient's sociocultural context into account when choosing which treatment options to present to families, HCPs thought that families' cultural beliefs sometimes made treatment decision-making more difficult and influenced youths' use of medication. Two studies with pediatric rheumatologists in Canada and the Netherlands found non-statistically significant differences in the factors they prioritized when deciding to discuss the withdrawal of biologics.
Conclusion: Few studies looked at the links between determinants of inequities and decision-making in JIA. More research would further the understanding of decisional needs in JIA based on these determinants of inequities and may help youths with JIA, their parents/caregivers and HCPs to make decisions adapted to their characteristics and contexts.

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Minorities are Under-Represented in SLE Clinical Trials: A Systematic Review and Meta-Analysis

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Objectives: With numerous emerging treatments for systemic lupus erythematosus (SLE), populations in trials should reflect the diversity of those affected by SLE so trials are generalizable and are fair/equitable. Data from some North American and European cohorts show that the prevalence of SLE in Black populations can be higher than White populations relative to background population ethnicities. The objectives of this study were to examine the racial composition of clinical trials in SLE from 2014 to 2024, assessing whether these trials accurately represent the diversity of SLE populations.

Methods: A systematic review of the literature was conducted using EMBASE, PUBMED, Web of Science, and Cochrane CENTRAL from Jan 1, 2014 – May 14, 2024. Randomized trials of pharmaceutical interventions in SLE patients were included. Studies were excluded if they had less than 50 participants, were not in English, or did not report on race/ethnicity. Revman 5.4 and SPSS were used for statistical analysis.
Results: The literature review identified 2,505 citations, of which 63 were included in the analysis. Of the trials screened for analysis, 39.8% did not report on race, and 12.4% had a sample size less than 50 participants. The proportion of females in the included studies was 91% [95% CI: 90-92]. White patients constituted 61% [55-66] of trial participants, while Black participants represented 14% [9-18] (Figure 1). Asians accounted for 14% [12-17], and Indigenous patients 8% [6-10]. Hispanics 37% [31-43], no Pacific Islanders were included [0-0%], and patients of mixed race (by the definition within each study) constituted 3% [2-5] (Figure 3). None of the included studies reported on smoking status, education, marital status, or employment status.
Conclusion: Standardized reporting of SES surrogates should occur (i.e. education, household income). Minorities seem under-represented in RCTs. Greater effort is needed to ensure that SLE research trials are generalizable to patients and are equitable to reflect the diversity of those living with SLE.

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Variations in Tacrolimus Whole Blood Concentrations During Pregnancy and Its Implications for Therapeutic Drug Monitoring: A Systematic Review and Meta-Analysis

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Objectives: Tacrolimus is a pregnancy-compatible immunosuppressive increasingly used in systemic lupus erythematosus (SLE) pregnancies. Physiological changes throughout pregnancy alters the whole blood concentrations of tacrolimus during gestation. However, data is very limited to guide clinicians caring for pregnant women receiving tacrolimus in interpreting tacrolimus trough levels and adjusting the dosage. We completed a systematic review focusing on the variations of maternal tacrolimus trough levels and dosage during SLE and non-SLE pregnancies.
Methods: Using a combination of relevant search terms and keywords, we systematically searched Embase, Ovid, PubMed, Web of Science and Cochrane Library up to January 2024. All observational studies which measured whole blood tacrolimus trough levels during pregnancy were included without language or date restriction. Random-effects models were used to estimate standardized mean differences (SMD) or mean differences (MD), with 95% confidence intervals (CI) of tacrolimus trough levels and doses before, during and after pregnancy.

Results: Of 404 publications identified, 282 were screened based on title and abstract, of which 53 full-text articles were assessed for eligibility. Eighteen articles were included in the systematic review and 13 in the meta-analysis. Only 2 studies assessed tacrolimus levels in SLE pregnancies, while the remainder were in pregnant organ transplant recipients. Tacrolimus levels significantly decreased during pregnancy compared to pre-pregnancy (SMD -1.05; 95% CI -1.72, -0.37), and significantly increased in the postpartum compared to levels during gestation (SMD 0.87; 95% CI 0.37, 1.37) (Figure 1. A, B). Mean differences in tacrolimus trough levels were -1.56 ng/ml (95%CI -2.82, -0.31) between first trimester and before pregnancy, -0.49 ng/ml (95% CI -1.04, -0.07) between second and first trimesters, 0.63 ng/ml (95% CI 0.30, 0.96) between third and second trimesters, and 1.28 ng/ml (95% CI 0.60, 1.96) between the postpartum and third trimester. The variation in tacrolimus levels during pregnancy was usually addressed by increasing the dose during pregnancy vs pre-pregnancy (MD 1.35 mg/day, 95% CI 0.23, 2.48) and decreasing the dose in the postpartum vs pregnancy (MD -0.92 mg/day; 95% CI -1.8, -0.01) (Figure 1. C, D).
Conclusion: Tacrolimus blood levels decrease during the first and second trimesters, then return to pre-pregnancy levels in the postpartum. Pregnancy often requires increased tacrolimus doses to keep trough levels within therapeutic ranges. Higher dosages might increase the bio-effective tacrolimus fraction, raising safety concerns about dose augmentation during pregnancy. More research is necessary to help clinicians adjust tacrolimus in SLE and non-SLE pregnancies to ensure optimal therapeutic drug monitoring in high-risk groups.

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Hospitalizations, Emergency, Physician Visits, Death, and Chronic Clinical Condition Among Rheumatoid Arthritis Patients with and Without Herpes Zoster, a Retrospective Administrative Data Linked Cohort Study

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Objectives: Herpes zoster (HZ) infection is a significant concern among seniors and immunosuppressed patients including those with rheumatoid arthritis (RA). We aimed to compare health care utilization (HCU) and mortality in RA patients with and without HZ from the public payers' perspective.
Methods: Patients from the Ontario Best Practices Research Initiative (OBRI) a longitudinal clinical cohort (2008-2020) were linked to the Institute for Clinical Evaluative Sciences (ICES), a population health database. Each HZ patient was matched to four non-HZ patients based on sex, age, and HZ diagnosis date. We analyzed HCU incidence and explored the impact of disease activity, patient outcomes, and RA medication on these results.
Results: The study included 269 RA patients with and 1072 without HZ. At index date (HZ diagnosis) patients with HZ were less likely to have private health insurance (45.7% vs. 56.5%) and more prone to use biologics (30.9% vs. 26.8%) and JAK inhibitors (3.7% vs. 2.6%). Hospitalization/ED visits and mortality were higher in HZ patients, but these differences were not statistically significant after adjusting for other factors. HZ patients had significantly

more physician visits (adj IRR: 1.17). Being female (adj IRR: 0.78) and a lower CDAI score (adj IRR: 0.80) were significantly associated with fewer physician visits. JAK inhibitor use was associated with a significant increase in mortality (adj HR: 4.73, $p<0.05$).
Conclusion: In this study, HCU, especially physician visits, were higher in RA patients with HZ. Managing RA disease, treatment strategies that minimize the risk of HZ and updating patients' vaccinations should be considered.

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Usability and Acceptability of the French Version of the "JIA Option Map" ("Carte d'Options en AJI"): A Web-Based Patient Decision Aid for Young People with Juvenile Idiopathic Arthritis"

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Objectives: Young people with juvenile idiopathic arthritis (JIA) often experience pain which has an important impact on their daily life. However, pain is often underestimated by health care providers (HCPs) and is not sufficiently discussed in clinical consultations. Our team developed the JIA Option Map, a web-based patient decision aid, which has demonstrated good usability, and acceptability. In the current study, we evaluated the usability and acceptability of the French version of the JIA Option Map ("Carte d'options en AJI").
Methods: We conducted usability and acceptability testing using virtual semi-structured interviews with a total of three adolescents 13-18 years old with JIA, three young adults 19-30 years old with JIA, as well as four parents of youths with JIA. We recruited participants from a pediatric rheumatology clinic and through patient organizations. Participants navigated the web application using the think-aloud method, and answered questions about ease of use, content, format, potential use, and perceived effectiveness. We videotaped interviews and transcribed and analyzed verbatim using simple descriptive content analysis.
Results: All participants felt that the app was easy to navigate and the format was user-friendly. All participants felt the content was appropriate and generally easy to understand. They mentioned they would use this app frequently, with the help of recently added reminders.

Participants felt the app would help them learn about a range of pain management strategies and help them engage in decision-making with HCPs. Participants liked the wide range of options with a colour-coded legend, the evidence-based summaries presenting their probabilities of benefits and harms, the links to online resources and tips to help follow their plan, as well as the dashboard which shows pain over time. Suggestions for improvement included clarifying some of the instructions and icons, adding pain management strategies and links to additional resources and videos and adding instructions to help monitor their pain.
Conclusion: The French version of the JIA Option Map has good usability and acceptability and has the potential to facilitate decision-making for pain management options among French-speaking young people with JIA and their families and HCPs in the clinic. Changes were made to improve the content and format of the app. Work is underway to test the effectiveness of the application over time.

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Do Changes in the Weather Influence Joint Pain and Stiffness in Children Living with Juvenile Idiopathic Arthritis?

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Objectives: Objective: Weather is a commonly reported factor related to flares of pain and stiffness in patients with Juvenile Idiopathic Arthritis (JIA). However, limited empirical data exist on the influence of weather in childhood rheumatological conditions. In Canada, where climate variations are pronounced, understanding how weather influences JIA symptoms could help enhance disease management and improve patient well-being. This study aimed to investigate whether weather conditions, including humidity, temperature, precipitation, and wind speed, are associated with pain and stiffness in Canadian children with JIA.
Methods: Methods: In this cross-sectional study, data were extracted from the Canadian Alliance of Pediatric Rheumatology Investigators (CAPRI) Registry, comprising children recruited within 3 months of JIA diagnosis at 20 participating sites across Canada. Measures of joint pain (severity scale 1-10) and stiffness (rated as yes or no and quantified in minutes) during visits for 653 children were matched with the preceding 2 weeks' weather data from the weather station nearest to the child's home postal code from the Government of Canada website. We employed logistic regression to evaluate the relationship among stiffness, pain, and weather parameters (humidity, temperature, precipitation, windspeed) within 1, 7, and 14 days of symptom reporting. Multiple linear regression was used to evaluate pain severity, while controlling for age and sex.
Results: Results: At participants' baseline visit, higher average maximum humidity in the preceding week was associated with increased reported stiffness (OR=1.26, 95% CI 1.06-1.50,

p=0.0076) and higher severity of joint pain (β=0.21, 95% CI 0.012-0.41, p=0.038). The association of humidity with stiffness also applied for the preceding day (OR=1.14, 95% CI 1.02-1.27, p=0.022) and 2 weeks (OR=1.24, 95% CI 1.02-1.50, p=0.031), but not for joint pain. Higher mean and maximum temperatures for the preceding day had a significant positive effect on joint pain severity (β=0.087, 95% CI 0.00-0.17; p=0.048 and β=0.086, 95% CI 0.013-0.16; p=0.021, respectively) holding all other variables constant. Total precipitation and windspeed in the preceding 1, 7, or 14 days were not associated with stiffness and joint pain.
Conclusion: Conclusion: We found significant associations between weather conditions, particularly humidity and temperature, and reported symptoms of joint pain and stiffness in children with JIA. Higher humidity was linked to increased stiffness and joint pain, while higher temperatures correlated with greater pain severity. Building on insights from this research can guide better management strategies for patients and their families, allowing them to anticipate and mitigate the impacts of adverse weather conditions.

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Type I Interferon Status and Clinical Manifestations in a Large Cohort of Patients with Systemic Lupus Erythematosus

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Objectives: Type I interferons (IFN) are pivotal in the pathogenesis of SLE, with high IFN gene signature (IGS) status associated with certain organ manifestations, autoantibody profiles, and disease severity. With novel medications targeting the interferon pathway, an enhanced understanding the IGS in patients with SLE is necessary. Recent studies have shown IFN levels remain stable overtime despite changes in disease activity and treatment. In this study, we investigated the IGS in relation to clinical characteristics in patients with SLE.
Methods: Patients who met 2019 EULAR/ACR classification criteria for SLE, from a single centre, were included. Whole blood collected was analyzed for IGS by the DxTerity assay, categorizing patients into IFN high or IFN low status. SLEDAI-2K organ domains were cumulatively characterized from 5 years prior to whole blood collection to last available visit. Clinical characteristics, including SLICC/ACR damage index (SDI), cumulative antibody status, glucocorticoid and immunosuppressive use, were analyzed according to IFN status.
Results: Five-hundred-six patients with median age of 49.53 years (IQR 37.27-60.54) were included, with 291 (57.5%) IFN high and 215 (42.5%) IFN low (Table 1). The median duration of SLE disease was longer in the IFN low group (22.7 years [IQR 11.58-21.05]) than in the IFN high group (14.06 [QR 7.90-24.71]) (p<0.001). There was no difference in the proportion any of the individual SLEDAI-2K organ domains between the IFN high and low groups, though there was a numerical difference in the hematologic domain (IFN high 82.8% versus 73.0% [p=0.011]). The median SLEDAI-2K score was higher in the IFN high group (2.00 [IQR 0.00-4.00]) then in the IFN low group (0.00 [IQR 0.00-4.00]) (<0.001). More patients in the IFN high

group had positive Smith (56.7% vs. 32.6% [p<0.001]), RNP (66.7% vs. 49.3% [p<0.001]), Ro (67.4% vs. 47.0% [p<0.001]), La (30.9% vs. 17.2% [p=0.001]), chromatin (75.6% vs. 41.9% [p<0.001]), dsDNA (61.2% vs. 38.1% [p<0.001]) and ribosomal P (27.1% vs. 7.9% [p<0.001]) autoantibodies, with no differences in levels of C3 and C4 or in the presence of antiphospholipid antibodies. More patients with IFN high status were on glucocorticoids (112; 38.5%) then were patients with IFN low status (58, 27%) (p=0.009). More IFN high patients were on immunosuppressants (185; 63.6%) vs. the IFN low group (98; 45.6%) (p<0.001).
Conclusion: In this large cohort of patients with SLE, IGS status may help to predict disease severity, use of glucocorticoids, and overall use of immunomodulatory therapy, though IFN level did not predict presence of SLEDAI-2K organ domains.

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Updating the Omeract Systemic Lupus Erythematosus Core Outcome Set

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Objectives: 1. Generate a list of preliminary Systemic Lupus Erythematosus (SLE) domains in consideration for the SLE Core Outcome Set (COS). 2. Winnow and bin the preliminary domains into a final list of candidate domains with agreed upon definitions.
Methods: 1. Preliminary Domain Generation a) In order to review the continued importance of known SLE domains and generate novel candidate domains, a survey assessing the importance of known SLE domains and asking respondents to recommend additional domains was conducted. The survey was administered to 100 patients from the University of Toronto Lupus Clinic and 175 members of the Outcome Measures in Rheumatology (OMERACT) SLE Working Group. b) To identify preliminary domains from the literature, a scoping literature review of SLE clinical trials and systematic reviews since 2010 was conducted extracting domains, definitions, and methods of assessment (measurement tools). c) Domains important to patients living with SLE were identified through focus groups held with 36 SLE patients representing 5 continents. Patients were asked a wide variety of questions to identify all manners of domains and transcripts from interviews were thematically coded. 2. Candidate Domain Sorting a) The OMERACT SLE Advisory Group met regularly to winnow and bin the preliminary SLE domains. b) Definitions for the candidate domains were retrieved from the scoping literature review and from additional literature searches. Definitions were reviewed, modified, and agreed upon by the OEMRACT SLE Advisory Group.
Results: The domain survey, the scoping literature, and the focus groups generated many preliminary domains which was winnowed and binned into 25 candidate: Adverse Events, Anxiety, Cognition Impact, Cognitive Function, Depression, Economic Cost Impact, Emotional Health , Fatigue, Flares, Frailty, Health-Related Quality of Life, Pain Intensity, Pain Interference, Participation, Patient Global Assessment of Disease Activity, Physical Function, Physician Global Assessment of Disease Activity, Reproductive Health, Sexuality, SLE Disease Activity, Sleep, Stress, Tissue/Organ Damage, Treatment Satisfaction, and Use of Glucocorticoids Including Tapering. Definitions for the 25 candidate

domains have been agreed upon (Table1).
Conclusion: The domain generation stage of updating the SLE COS is complete. The next stage involves achieving consensus on the core domains to form the SLE COS through a 4-round Delphi consensus exercise with international collaborators (patients, clinicians, researchers, pharmaceutical representatives, and more) beginning in January, 2025. Following the establishment of the core domains will be measurement instrument selection where candidate instruments will be identified and appraised for each core domains, yielding the final SLE COS.

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Improvements in Bilag Musculoskeletal and Mucocutaneous Domains at Week 48 in a Phase 2 Double-Blind Placebo-Controlled Trial of Abbv-599 (Elsubrutinib + Upadacitinib Combination) and Upadacitinib Monotherapy for Treatment of Moderately to Severely Active Systemic Lupus Erythematosus

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Objectives: ABBV-599 is a novel combination of elsubrutinib (ELS; a selective Bruton's tyrosine kinase inhibitor) and upadacitinib (UPA; a selective Janus kinase inhibitor), which targets separate signaling pathways associated with SLE. After 48 weeks of treatment with ABBV-599 high dose (HD; ELS 60 mg + UPA 30 mg) or UPA 30 mg monotherapy in the phase 2 SLEek study, patients with SLE demonstrated improvements in composite disease activity measures (BICLA and SRI-4) and flares compared with placebo. The objective of this post hoc analysis of the SLEek trial was to evaluate changes from baseline at week 48 in BILAG domains in patients with SLE receiving ABBV-599 HD, UPA 30 mg, or placebo.
Methods: In this multicenter, double-blind trial (NCT03978520), patients with moderately to severely active SLE were randomized 1:1:1:1:1 to receive once daily ABBV-599 HD, ABBV-599 low dose (LD; ELS 60 mg + UPA 15 mg), ELS 60 mg, UPA 30 mg, or placebo. After a planned interim analysis, the ABBV-599 LD and ELS 60 mg groups were discontinued for lack of efficacy. This post hoc analysis evaluated BILAG domains and improving score shifts from baseline to week 48 in the continued treatment groups. For this analysis, definitions of 1-score shifts were BILAG A to B or B to C, 2-score shifts were BILAG A to C or B to D, and 3-score shifts were BILAG A to D.
Results: Among patients with BILAG A or B domain activity at baseline, a higher proportion of the ABBV-599 HD or UPA 30 mg groups than placebo achieved improvements in the BILAG musculoskeletal and mucocutaneous domains at week 48 [Table]. Among patients in the UPA 30 mg and ABBV-599 HD groups who achieved an improvement, 2- or 3-score shifts from baseline to week 48 were achieved by > 80% and > 50% of patients in the musculoskeletal and mucocutaneous domains, respectively. Conclusions could not be drawn regarding the remaining BILAG domains due to small sample sizes and exclusion of patients with active neuropsychiatric SLE or severely active lupus nephritis.

Conclusion: Both the ABBV-599 HD and UPA 30 mg treatment groups showed improvements in the musculoskeletal and mucocutaneous BILAG domains at week 48 compared with placebo. This analysis allows an early comparison of these frequent individual manifestations in a smaller trial and highlights the importance of examining improvement in each. A large global phase 3 program to expand the evaluation of UPA in SLE is ongoing (NCT05843643).

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The Efficacy of Leflunomide in the Treatment of Giant Cell Arteritis: a Systematic Review and Meta-Analysis

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Objectives: The objective of this systematic review is to assess the effectiveness of leflunomide in the treatment of new-onset, refractory or relapsing giant cell arteritis (GCA) as a glucocorticoid (GC)-sparing agent.

Methods: A systematic review was conducted using MEDLINE, CENTRAL, EMBASE, and conference proceedings to identify studies on leflunomide in patients with GCA. We included randomized controlled trials, cohort studies, case-control studies, and case series. The primary efficacy outcome was the proportion of patients who attained GC-free remission with leflunomide assessed at any time between 6 to 12 months of therapy. GC-free remission was defined as the absence of signs or symptoms of GCA, and/or normalization of inflammatory markers, and/or radiologic response, and complete discontinuation of GC. Our secondary efficacy outcome was the proportion of patients who attained low-dose GC remission (< 5 mg of prednisone equivalent). All included studies were appraised for risk of bias. We performed a meta-analysis of proportions using a random-effects model and a restricted maximal likelihood approach. We evaluated heterogeneity with I2 and Cochran's Q test. Publication bias was assessed by producing funnel plots for each outcome.

Results: 357 studies were screened with 10 observational studies included in the final analysis. Out of the 358 patients that we pooled for analysis, 231 (69%) were females. A total of 233 (65%) patients had new-onset GCA, 83 patients had relapsing GCA (23%) and 19 patients had refractory GCA (5%). The disease subtype was not specified for 23 patients. The proportion of patients achieving GC-free remission with leflunomide was 45%, (95% CI 0.25-0.64, $p<0.001$, 7 studies) (Figure 1). Substantial statistical heterogeneity was present ($I2=90.3\%$, $Q=70.7$, $p<0.001$). Meanwhile, the pooled proportion of patients achieving low-dose GC remission was 48% (95% CI 0.27-0.69, $p<0.001$, 6 studies). Funnel plots were slightly asymmetrical, which suggested the presence of publication bias as well as possible poor methodological quality in the reporting of outcomes. All the included studies were deemed to be at serious risk of bias.[1]

Conclusion: The main challenge in treating GCA is achieving and maintaining remission with minimal glucocorticoids. Our study shows that leflunomide may offer potential benefits in achieving remission without GCs or with low-dose GCs; however, the results exhibited variability due to differences in sample sizes and inconsistent reporting. Leflunomide's role as a

glucocorticoid-sparing agent is promising but needs further investigation in higher-quality studies. PROSPERO registration CRD42023490373.

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Co-Designing a Patient-Facing Dashboard with Patients and Healthcare Providers: Gathering User Input

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Objectives: To co-design with rheumatology patients, healthcare providers, and human-centered design experts, a patient-facing dashboard that displays patient-reported outcome measures (PROMs) and clinician-derived data over time.

Methods: We recruited participants from the Rheum4U Precision Health Registry (PHR) to participate in semi-structured interviews or focus group sessions. Purposive sampling was used based on type of inflammatory arthritis (IA), sex, and geographic location. All the participants engaged in a card-sorting activity in which they sorted the content collected from the Rheum4U PHR's web-based platform based on they wanted to see included in the dashboard. During each session, the participants' preferences of the content and features of dashboard, and the use of the dashboard were explored. The card-sorting data were analyzed using content analysis. Transcripts were analyzed using thematic analysis with NVivo software, guided by the Reach, Effectiveness, Adoption, Implementation, Maintenance (RE-AIM) and Practical, Robust, Implementation and Sustainability Model (PRISM) frameworks[1,2]. The data from the card-sorting activity and interviews and focus-groups were used to inform human-centered design experts in creating a low-fidelity mock-up of the dashboard in an interface design tool, Figma [3].

Results: Six patients, four nurses, and three rheumatologists participated in the sessions. The card sorting activity revealed the prioritized content deemed most beneficial by participants including disease activity (e.g., CDAI, BASDAI, DAS28), physician global, health assessment questionnaire (HAQ) score, pain intensity, and level of fatigue. Key themes emerging from the thematic analysis included: 1. Clear visual representations of longitudinal data trends and comparison over time. 2. Insights into treatment effectiveness. 3. User-friendly navigation of the dashboard. 4. ntegration with the electronic medical record system. 5. Integrating educational resources relevant to their IA. 6. Alerts for worsening PROMs. 7. Mobile access to the dashboard for patients. The mock-up of the dashboard based on these themes is displayed in Figure 1.

Conclusion: Co-designing a patient-facing dashboard by patients and healthcare providers supports the identification of priority for intuitive data visualization of personalized health metrics and for integrating resources to support understanding of disease progression to guide care needs. A collaborative approach to the construction of dashboard enhances the potential for all users to benefit once the tool is available.

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Entrustable Professional Activities for Musculoskeletal Ultrasound Training in a Canadian Rheumatology Residency Program: A Pilot Study

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Objectives: Point-of-care Musculoskeletal ultrasound (MSUS) training is increasingly being implemented in the rheumatology training programs. However, a validated framework to reliably assess MSUS competency is needed. Recommendations for MSUS education in Canadian rheumatology residency programs were recently established by a national expert consensus panel.1 Our study aimed to develop, evaluate, and implement MSUS Entrustable Professional Activities (EPAs) within the Adult Rheumatology residency program at the University of Toronto.

Methods: MSUS EPAs were developed by an expert MSUS panel of rheumatologists to define the progress in MSUS skill competency level on a 5-point entrustability scale indicating the resident's level of independence. The EQual rubric was employed to appraise the quality of the EPAs through soliciting input from 5 clinical educators with substantial expertise in MSUS.2 Data aggregation was performed to determine if the quality of the EPAs met satisfactory standards. Post-Graduate Year (PGY) 4 and 5 rheumatology residents enrolled in a two-year longitudinal MSUS curriculum at the University of Toronto participated in this study during 2023-2024. As part of the curriculum, they received fundamental MSUS teaching and participated in bimonthly hands-on MSUS clinic where they had EPAs completed. The residents self-reported their cognitive load level following completion of the EPA task using the NASA Task Load Index.

Results: Five EPAs were developed by a panel of six expert rheumatology ultrasonographers for five joint regions including the finger, wrist, knee, ankle and foot. Pooled data from EQual rubric ranged between 4.2-4.3 for all EPAs, passing the satisfaction cutoff (4.07). Eighteen EPAs were completed by three PGY4/5 rheumatology residents enrolled in the longitudinal MSUS curriculum. Of all EPAs, 83% were entrustable (score of > 3/5). The wrist joint was the most difficult to entrust (40% entrustable). All the MSUS tasks were rated by the residents to be associated with high level of cognitive load (55%, N = 5) or somewhat high (45%, N = 4).

Conclusion: The quality of the five EPAs developed was deemed satisfactory, indicating their educational effectiveness. The implementation of MSUS EPAs offers a viable approach for assessing MSUS competencies in rheumatology residents receiving MSUS training. Innovative educational strategies are needed to reduce the cognitive load associated with trainees performing the MSUS tasks.

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Mini-Practice Audit Model (mPAM): Facilitating the CRA RA Guideline Implementation

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Objectives: Rheumatoid arthritis (RA) affects 1% of the Canadian population and is associated

with considerable morbidity and increased mortality. Recently an update to the RA guidelines was published by the Canadian Rheumatology Association (CRA) and the Cochrane MSK group. Research into guideline implementation demonstrates that successful uptake is facilitate by practice audits, self-assessments, enabling educational tools and informed continuing professional development (CPD). The goal of our project was to create and evaluate the implementation of a mPAM based education framework designed to increase uptake of the current rheumatoid arthritis (RA) guidelines. Use of the mPAM framework will enable rheumatologists to identify areas of knowledge and care gaps, as well as, enablers and barriers to the practical application of the RA guidelines.
Methods: An online survey based on the current RA guidelines was distributed to assay knowledge, attitudes and behaviours and inform a modified mPAM. This mPAM was distributed to CRA participants. Participants completed the mPAM and the results were analyzed using descriptive statistics and thematic analysis. Specific domains targeted included patient descriptors, specialtist's practice performance, and participant's reflections.
Results: Sruvey Results: Overall, participants believed in the use of guidelines in clinical practice. However, knowledge and application of the current RA guidelines was varied. Patient Descriptors: Of the charts analyzed using the mPAM, 60% of patients are currently in remission for RA over a range from 1 to 10 years. Of those patients in remission, 69% are receiving conventional synthetic DMARDs (csDMARDs), 23% are receiving biologic or targeted synthetic DMARDs (advanced therapies) and 8% other treatments. Of those not in remission, 57% are receiving csDMARDs, 0% advanced therapies and 43% are receiving other treatments. Specialtist's Practice Performance: Gaps in RA guideline applications were identified in the following areas: discussion of tapering (45%), discussion of possible flare-ups (38%), shared-decision regarding management of flare-ups (38%), and medication use (23%). Participant's Reflections: Thematic analysis eludicated the following: inconsistent documentation, lack of detail of medication, instructions, and shared-decision making. importance of frequent chart reviews, and identification of guideline gaps.
Conclusion: Use of the mPAM allowed gaps to be recognized in the clinical application and documentation of the CRA RA guidelines. Participants noted that the mPAM allowed them to identify gaps in clinical practice and assay ways to address these to positively impact patient care.

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Navigating the Roadblocks: National Patient and Provider Survey on Barriers to Healthcare and Medication Access for Patients with Vasculitis

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Objectives: Access to timely diagnosis, specialized care, and medications is critical for managing vasculitis. This study aimed to explore and quantify the barriers to healthcare access faced by patients and healthcare providers.
Methods: Two quantitative, descriptive surveys were conducted among patients with vasculitis and healthcare providers (HCPs), including rheumatologists, recruited through the Vasculitis Foundation Canada and Canadian Rheumatology Association. The survey assessed experiences related to diagnostic delays, appointment access, and challenges with medication availability.

Data collection occurred from September 2022 to June 2023, and responses were analyzed using descriptive statistics.
Results: The patient survey had an estimated response rate of 72% (n=100, 46% within the ages of 40-64, 80% were female, 88% were White, 82% had a drug coverage plan). The HCP survey had an estimated response rate of 76% (n=31, 94% were rheumatologists). Diagnostic delays were common, with 66% of patients reporting initial misdiagnoses, and 36% consulting five or more doctors before receiving an accurate diagnosis. Of those referred to a rheumatologist, 57% waited more than one month for an appointment, and 11% waited 3-6 months. Key barriers to timely diagnosis identified by providers included a lack of family physicians (74%), long waitlists (58%), and inappropriate referrals (48%). Forty-four percent of patients reported barriers to accessing or using medications, particularly related to adverse effects, out-of-pocket costs, and limited insurance coverage. Majority of patients (70%) reported their drug plan excluded or limited the use of certain medications. Ninety-three percent of providers reporting barriers such as prior authorization requirements and step therapy protocols. Rituximab, was the most frequently cited as difficult to access by patients and providers, with insurance denials and high out-of-pocket costs noted to be barriers to treatment initiation.
Conclusion: Patients with vasculitis face significant barriers to timely care and medication access, including diagnostic delays, long wait times, and insurance-related challenges. Addressing these barriers requires systemic changes in healthcare delivery, including improved access to rheumatologists and streamlined medication approval processes. These findings highlight the need for targeted interventions to enhance vasculitis care.

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A Comparative Study of Difficult-To-Treat Vs Non-Difficult-To-Treat Psoriatic Arthritis for Disease Burden and Comorbidities: an Ultrasound Study

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Objectives: In the era of several advanced therapies and an increased number of patients with psoriatic arthritis (PsA) who have been failed by multiple treatment options, a better understanding of Difficult-to-Treat (D2T) PsA is essential and timely. In this analysis, we aimed to explore the D2T PsA patient phenotype, by comparing the clinical features, comorbidities, and ultrasonographic features of peripheral arthritis and enthesitis domains with non-DT2 PsA, to understand factors contributing to the D2T state.
Methods: Patients were recruited from the ORCHESTRA (Ottawa Rheumatology CompreHEnSive Treatment and Assessment) Clinic, where all patients with inflammatory arthritis who are about to initiate a new advanced therapy are assessed using a standardized protocol including disease features, medications, comorbidities, and clinical disease activity measures. A protocoled ultrasound (US) was performed including 44 joints for synovitis and 14 entheses for enthesitis. Synovitis was scored using the Global OMERACT-EULAR Synovitis Score (GLOESS). Elementary lesions of enthesitis included hypoechogenicity, thickening, and

power Doppler signals (features of inflammation) and erosions, calcifications, and enthesophytes (features of damage), all being on a scale of 0-3 (none-mild-moderate-severe). Relevant features were summed to reach inflammation, damage, and total enthesitis scores per patient. For this analysis, D2T PsA definitions were extrapolated from the EULAR definition of D2T Rheumatoid Arthritis. (1) Patients who fulfilled the D2T PsA definition were compared with the patients who did not fulfill (non-D2T).
Results: Among 52 PsA patients, 16 (30.8%) fulfilled the definition of D2T PsA. Demographics were similar between the two groups, except the male sex being numerically higher in D2T PsA patients (n=10/16 (62.5%) vs n=13/36 (36.1%); p=0.077) and having longer disease duration (table 1). Disease activities were similar between groups, both clinically and on US, and CRP levels were even lower in D2T PsA patients (p=0.022). Gout and inflammatory bowel disease were statistically higher in D2T PsA patients than non-D2T group (table 1).
Conclusion: There were no clinical and ultrasonographic differences in peripheral arthritis and enthesitis domains between patients with D2T and non-D2T PsA. In our patient population, comorbidities, gout, and inflammatory bowel disease seem to be associated with D2T state, but not necessarily a higher disease burden.

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Elucidating the Program Theory of a Successful Interdisciplinary Team-Based Model of Rheumatology Care: an Implementation Science Exploratory Case Study

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Objectives: The increasing prevalence of RMDs has resulted in a demand for care that surpasses the supply of rheumatologists, necessitating innovative care models to provide accessible, effective treatment. Interdisciplinary team-based models of rheumatology care, involving rheumatologists working with interdisciplinary health professionals (IHPs), have shown promise in improving quality of RMD management and patient outcomes. An understanding of the key components of successful interdisciplinary team-based rheumatology care, and how they operate to achieve their effects, remains elusive and is crucial to facilitate spread and scale. Our objective was to elucidate the program theory underlying the Centre of Arthritis Excellence (CArE), Ontario's only provincially funded community team-based model of rheumatology care.
Methods: We conducted an exploratory case study of CArE guided by the Medical Research Council Framework for Developing and Evaluating Complex Interventions. We focused on the interaction with context, the underpinning program theory (how and why it achieves its intended outcomes), and diverse strategic partner perspectives. We completed semi-structured interviews with CArE patients (n=9) and health professionals (rheumatologists n=3, IHPs n=6, and administrators n=1), naturalistic observations (n=3), and relevant document review (n=32). Framework analysis was informed by the Consolidated Framework for Implementation Research 2.0, Expert Recommendations for Implementing Change, and the Implementation Outcomes Framework. We triangulated learnings to construct a program theory following an

implementation research logic model (IRLM).
Results: The CArE interdisciplinary model involved rheumatologists and IHPs (including physical therapists, occupational therapists, and pharmacists) working within the same physical space and patient medical record system, sharing responsibilities along the continuum of rheumatology care from initial referral and throughout follow-up. Actioning this model distributed responsibilities away from the rheumatologist and enabled greater capacity for timely patient visits and comprehensive, person-centered care. Provision of ongoing training and mentorship to the IHPs was critical for their skill development and functioning within the rheumatology environment, and in turn, led to greater IHP autonomy and satisfaction. IHPs' delivery of disease education to patients supported patient disease knowledge and self-efficacy, enabling improved self-management. The ongoing evaluation, refinement and adaptations of the model supported changing care needs. We present an IRLM in Figure 1.
Conclusion: By elucidating the program theory of CArE, this study has provided insights into the critical components and contextual factors that contribute to successful delivery of interdisciplinary team-based rheumatology care. The findings will support the adoption, spread and scale of effective team-based models, aiming to improve the quality of care for individuals with RMDs.

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Impact of a Physician Extender on Outpatient Rheumatology Capacity & Wait Times

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Objectives: To determine the impact of an unlicensed international medical graduate (IMG) in a physician extender role within a multi-doctor urban rheumatology clinic on the number and average wait times of new patient consultations.
Methods: A retrospective quality improvement framework was adopted. Starting September 2022, an IMG served as a physician extender, assisting with new consultations one day per week for each of the four rheumatologists in the clinic. All new consultations seen between September 1st, 2021 and August 31st, 2023 were included in the study. The pre-IMG period was established as September 1st, 2021 to August 31st, 2022 and the post-IMG period was from September 1st, 2022 to August 31st, 2023. For each new consult, the referral date and date seen in clinic were extracted from the local electronic medical record system with the wait time calculated as the difference between the referral date and the new consultation date. These data were plotted and analyzed using run chart statistics.
Results: In the pre-IMG period, the average number of new consults seen per month was 108.0 with an average wait time of 105.1 days compared to 110.6 new consults and 84.6 days in the post-IMG period across all physicians. In the post-IMG period, doctor-specific outcomes varied. For Physician 1, average wait time decreased by 15.9 days with 121 more new consults seen compared to the pre-IMG period. However, for Physicians 2 and 3, the number of new consultations remained stable but average wait time decreased by 35.9 and 52.5 days respectively. Physician 4 saw fewer new consultations post-IMG with average wait time

remaining constant. [Figure 1]
Conclusion: The use of an IMG in a physician extender role showed mixed results. While wait times reduced in three of four physicians, new consults did not reliably increase in tandem. While employing an IMG in similar roles may increase clinic capacity and timely access to care, outcomes may be related to each physician's unique approach in implementing this physician extender. Future research should consider these different approaches.

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An Advanced Physiotherapist Practitioner's Level of Safety Performing Juvenile Idiopathic Arthritis Care (Applejac) – Comparing Key Performance Indicators with the Pr-Coin Registry

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Objectives: The advanced physiotherapist practitioner (APP) model of care (MOC) has existed for 20 years in Canada in pediatric rheumatology. [1] The APP manages children with Juvenile Idiopathic Arthritis (JIA) in shared care models with pediatric rheumatologists. The extent to which the quality of care these children receive from an APP compared to a physician is unknown. The PRCOIN network tracks quality, safety and access key performance indicators (KPIs) in JIA care. [2] This study aimed to analyze the frequency and outcomes of KPI's documented in an APP MOC for management of JIA, and compare these findings to PRCOIN to assess quality, safety and access of care.
Methods: A retrospective chart review of JIA cases managed by one APP at a tertiary pediatric rheumatology clinic between June 2022 to May 2024 was conducted. Quality KPIs included active joint count, pain score, physician and patient global assessment, cJADAS, physical function and QoL measures. Safety KPIs included TB and uveitis screening, and lab monitoring. Access was measured by documentation of at least one visit in 12 months.[2] Documented frequency of KPIs and their outcomes by the APP were compared with PRCOIN data from same center (SC) (3 rheumatologists) and PRCOIN (16 centers).
Results: The APP saw 33 unique patients with 1-8 visits each totalling 138 eligible visits. The SC saw 73 unique patients and PRCOIN saw 4,297 for a total of 151 and 12,162 eligible visits respectively. Gender (F:61–69%) was similar amongst all groups; Mean (SD) age of patients with APP was 9.3 years (4.7), SC 12.4 (4.5) and PRCOIN 13.3 (5.1). Most common JIA subtype for all groups was oligoarticular persistent (26 – 33%). 9.1% of patients seen by the APP had Poly-articular RF+ compared to SC and PRCOIN (1.6%,5.0%). 18% of patients seen by the APP had Psoriatic Arthritis compared to SC and PRCOIN (1.7%;9.2%). All KPI frequency thresholds were exceeded in the APP cohort [Table 1] and were comparable or higher to other groups. Cases achieving low disease activity (cJADAS <3) was 55% for the APP and (74.4%;63.2%) for SC and PRCOIN, respectively. The APP had 71% of visits with pain rating of <1 compared to the SC and PRCOIN (69%;56%).
Conclusion: The pediatric rheumatology APP MOC meets and exceeds quality, safety and access standards of care with comparable outcomes to JIA care by pediatric rheumatologists. Next steps include replicating this study in other pediatric rheumatology centers with an APP MOC.

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The Gapps Study Gender and Advanced Physiotherapist Practitioner Satisfaction in Pediatric Rheumatology The Gapps Study Gender and Advanced Physiotherapist Practitioner Satisfaction in Pediatric Rheumatology Opinions of Parents and Teens

Julie Herrington (McMaster University, Hamilton); Simran Heera (McMaster University, Hamilton); Karen Beattie (McMaster University, Hamilton); Michelle Batthish (McMaster University, Hamilton)

Objectives: In Canada, Advanced Physiotherapist Practitioners (APP) manage complex rheumatic disease cases in shared care models.[1] The APP role has been studied in adult rheumatology, with little focus on pediatrics or how this role impacts gender.[1] Rheumatic diseases disproportionately affect women with this disparity evident in children, however research is not often tailored to investigate impacts of care based on gender.[2] In a Canadian pediatric rheumatology center with an APP shared care model, we aimed to i) measure and describe parent and patient satisfaction and ii) explore differences between patient and parent responses based on gender.

Methods: This mixed-methods, cross-sectional study included all parents and patients 12-17 years seen by one APP at McMaster Children's Hospital (June–August 2024). Each family was a unique case with multiple responses (patient and/or parent(s)). Patient and parent demographics were collected. We used an adapted 9-item Visit-Specific Questionnaire (VSQ) with each response reported by 5-point Likert scale (scores transposed to 100) and open-ended questions. Continuous variables were reported using means and 95% confidence intervals, categorical variables using frequencies and proportions. Qualitative responses were analyzed using inductive content analysis.

Results: Of 43 unique cases, (16 new consults, 27 follow-ups); 44% (n=19) were not rheumatic and 30% (n=13) had Juvenile Idiopathic Arthritis. Of parents (n=50), 64% (n=32) were female, 50% (n=25) and were 41-50 years. Of 16 patients, 69% (n=11) were female and 69% (n=11) were Caucasian. Regardless of gender, both patients and parents reported lower satisfaction for wait time (VSQ1) and discussing arthritis management (VSQ6). [Figure 1] Parents reported >90% satisfaction for explanation of results, technical skills, personal manner and the visit overall (VSQ4,7,8,9). While patients reported >80% satisfaction for personal manner (VSQ8) and >75% for answering questions (VSQ3). Female patients and female parents total VSQ score was 72.2(60.6–84.8); 90.6(86.6-94.7) respectively. Themes that emerged from open-ended questions included: thorough, knowledgeable, friendly and compassionate, provided conservative treatment, value and respect.

Conclusion: Parents and patients reported being highly satisfied with APP care in a pediatric rheumatology shared care model. Female patients reported lower satisfaction scores than other groups indicating a need for further investigation of their health care experiences. Lack of validation of the VSQ in pediatric populations may have impacted results as well as relevance of questions regarding arthritis management considering 44% of the sample did not have arthritis. Qualitative descriptions are consistent with APP literature [3] and should be considered when defining important aspects of APP roles.

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Assessing Quality of Post-TJR Rehabilitation: Care Gaps and Patient Perspectives

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Objectives: Patients' access to and experiences with rehabilitation care after total hip (THR) and knee (TKR) replacement surgery vary greatly across Canada. To better understand these differences and increase access to acceptable, effective and equitable care, we developed quality indicators (QIs). The 10 QIs based on literature reviews and a Delphi consensus process1,2, reflect the minimum standard of rehabilitation care that patients should expect to receive after THR and TKR.

Methods: To capture patients' perspectives and care experiences, we created a patient QI questionnaire and co-tested its usability with patient partners, to ensure clarity and ease of use. Patients indicated whether they received the QI-specific assessment or intervention (5-point ordinal scale) and rated its importance to them (4-point scale). We collected demographic and treatment information and explored respondents' rehabilitation experiences and satisfaction with outcomes. The English survey was administered through REDCap and fully launched January 2024 for individuals who had a recent THR or TKR and completed their supervised rehabilitation. A French language version will be launched shortly. We performed descriptive data analysis (means, standard deviation, percentages).

Results: To date, 192 individuals completed the full questionnaire with representation from all provinces and territories. (See Table 1) On average, respondents reported that 45.1% (SD 23.8%) and 43.4% (SD 28.2%) of the QIs were met for THR and TKR respectively. Adherence was lowest for QI-2 (comprehensive physical exam) and highest for QI-6 (assessing/supporting physical activity). The QI with highest importance ratings related to QI-9 (exercise interventions) for both procedures. We found discordance between patients' ratings of what was done (QI met) and what was important. For example (TKR), QI-3 (use of standardized patient reported outcome measure for function), was met for 40% of patients yet 63% rated this as very important. Overall satisfaction with outcomes of surgery and rehabilitation (satisfied/very satisfied) were the same for THR (91%) and TKR (90%); however, a higher proportion of individuals with a THR (56%) were very satisfied compared to TKR (48%). Overall experience ratings (good/excellent) were similar (THR 77%, TKR 82%). Additional analyses of associations between respondent demographics, QI adherence, and rehab care experience and satisfaction will be presented.

Conclusion: From the patient perspective, there is low overall physiotherapist adherence to the 10 THR and TKR rehabilitation QIs. Patients' importance ratings for many of these QIs highlight the need for change in clinical practice and further testing of the QIs to assess their impact on patient outcomes and care experiences.

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Development of National Clinical Practice Guidelines for Transition in Rheumatology

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Objectives: In 2017 the European League Against Rheumatism/Pediatric Rheumatology European Society published recommendations for the transition of young people with childhood-onset rheumatic diseases to adult care [1]. Building on this work, a CRA Guidelines Working Group (WG) was formed in 2020 to develop Clinical Practice Guidelines for Transition in Rheumatology in Canada.

Methods: Six rheumatologists (5 pediatric, 1 adult), an advanced physiotherapist practitioner, two young adult patients, and a methodologist formed the WG. This multi-phased project began with a scoping review of systematic reviews related to transition published between 2015-2020. From this, the WG defined key outcomes relevant to transition which informed the drafting of 20 candidate statements. Next, the "GRADE adolopment" framework was followed to adapt, adopt or develop a new recommendation, reducing the candidate statements to 15. Evidence to Decision (EtD) tables were developed for each candidate statement summarizing benefits/harms, the certainty of the evidence, values/preferences, resources, equity, acceptability, and feasibility [2]. In 2023 an updated literature review further informed the quality and strength of the evidence. In 2024, additional stakeholders (adult/pediatric rheumatology, nursing, social work, pharmacy, and parent) were invited to participate in a modified Delphi consensus process via Zoom [3]. Following an in-depth orientation session, panelists received a detailed document summarizing the candidate statements with corresponding EtD tables. Via online survey, panel members were asked to rate importance, priority, and feasibility on a Likert scale (1 – 9) and comment on agreement with the assigned strength of the recommendation and wording of the statement. A final consensus meeting is underway to discuss survey feedback. Any further modifications to the candidate statements will be incorporated into the final statements. Panelists will then complete an online survey asking for a final endorsement of the guidelines.

Results: All panelists completed the survey; all statements met the pre-specified cut-off for importance and priority (median ≥7/10). This included 3 Good Practice Statements (GPS), 11 conditional recommendations, and 1 Implications for Research statement [Table 1]. Two of three final consensus meetings are complete; it is anticipated statement 8 will become a GPS, statement 10 will be incorporated into statement 9, and statement 12 will be modified for clarity.

Conclusion: This comprehensive clinical practice guideline will mark a significant advancement for patients, caregivers and health care providers involved in the transition of youth with rheumatic disease in Canada, offering clear, evidence-based recommendations that facilitate effective and coordinated care across various settings.

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Appointments by Choice: an Implementation Pilot Study for Patient-Initiated Follow-Up Care in Rheumatoid Arthritis

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Objectives: The aim of the study was to conduct an implementation pilot for Appointments by Choice (ABC), a new patient-initiated follow-up model seeking to optimize follow-up efficiency and patient-centeredness of rheumatoid arthritis (RA) care. Objectives were to evaluate patient recruitment and early implementation outcomes.

Methods: The implementation pilot started in January 2024 at a single rheumatology clinic in Calgary. Eligible patients had (1) established RA, (2) well-controlled disease, (3) no major medication changes, and (4) no other active complex conditions. Patients and providers used a discussion tool for shared decision-making about moving from regular care to the ABC pathway (Figure 1). This included scheduling a new follow-up interval of 12-24+ months, a reduction compared to usual care. Between rheumatologist appointments, patient care was managed through a pharmacist-led clinic. Self-care was encouraged using a flare action plan. Baseline demographics were collected via survey and chart review. Feasibility was measured through recruitment numbers, ABC pathway adherence, flare clinic workload, and implementation adaptations using the FRAME criteria [1.]. Preliminary data on ABC recruitment and feasibility were summarized using descriptive statistics.

Results: Over 8 months, 38/108 (35.2%) eligible individuals with RA chose to adopt the ABC pathway. 28 participants provided reasons for declining. Common reasons included lack of time/interest in research (n=6), concerns about reduced care access (n=3), and preference for usual care (n=5). Mean participant age was 59.5±11.0 years, with 82.7% identifying as White and 10.3% as Southeast Asian. Mean RA duration was 13.3±9.1 years. Only 2/38 (5.3%) participants withdrew from the study and returned to usual care, due to a major RA flare or inability to complete the baseline questionnaire. 36/38 (94.7%) remained on the pathway. The pharmacist-led flare clinic conducted 2 flare-related follow-up calls, 2 medication renewals, and 8 calls for other medical needs. One participant required an in-person follow-up. 32 implementation challenges were noted, 8 of which resulted in minor adaptations. Adaptations include opening recruitment to individuals with (1) RA with minor medication changes and (2) those with palindromic rheumatism who were on treatment and had positive serology; (3) adjusting recruitment timing to align with biologic renewal schedules, and (4) improving physician-pharmacist communication using a standardized electronic health record

"smartphrase" for detailing follow-up needs.
Conclusion: The ABC implementation pilot has provided valuable learnings for recruitment, implementation, and ongoing care when using patient-initiated follow-up models for RA care. Post-pilot analyses will provide additional insights on ABC safety, feasibility, and potential benefits. **Supported by a CIORA grant**

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Current Barriers to Accessing Mental Healthcare Resources for Inflammatory Arthritis Patients and How to Improve Support

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Objectives: To understand perspectives of inflammatory arthritis (IA) patients and healthcare providers on barriers to accessing mental healthcare resources and identify facilitators to better support patients at rheumatology clinic visits.
Methods: Semi-structured interviews and focus groups were conducted with patients, allied healthcare professionals, and rheumatologists until saturation of responses was reached. Patients with IA reporting varied levels of anxiety and depression were recruited from the Rheum4U Precision Health Registry using purposive sampling. Healthcare providers were from two rheumatology clinics in Calgary. Surveys with closed-ended questions were completed by patients on their use of mental healthcare resources and healthcare providers on supporting their patients with accessing resources. The sessions explored barriers to accessing mental healthcare resources and facilitators that could support patients. Inductive thematic analysis was used to code perceived barriers and facilitators to accessing mental healthcare resources.
Results: Six patients, two allied health professionals, five nurses, and three rheumatologists participated in semi-structured interviews and focus groups. Four patients reported having anxiety/depression and three said they would like to discuss their mental health at rheumatology clinic visits. Key findings included: Patient challenges: patients have trouble initiating conversations about their mental health. While a social worker can assist in navigating resources, some patients are unaware of this resource. Healthcare provider constraints and attitudes: healthcare providers indicated they lack the time and support staff to discuss mental health with their patients. While some healthcare providers expressed concern about not screening for their patients' mental health , other providers believed addressing mental health concerns is out of scope. Systemic issues: healthcare providers discussed long wait times for mental health specialists and both patients and healthcare providers had difficulties navigating available resources. Supports needed: healthcare providers expressed a need for a 'toolkit' to better support their patients' mental health and additional training on this topic. A Venn diagram illustrating barriers and facilitators perceived by patients, allied health professionals and rheumatologists is shown in Figure 1.
Conclusion: Patients and providers expressed lack of clarity about the availability of mental health resources. There is variability in provider attitudes towards addressing mental health concerns during rheumatology appointments. Both patients and providers identified systemic issues in accessing mental healthcare resources. Quick screening, support from allied health professionals at the clinic, and a quick reference guide that incorporates existing workflow could potentially help improve access to mental healthcare resources for patients with IA.

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Current Practices and Experiences Accessing Care for Mental Health Issues of Inflammatory Arthritis Patients from the Rheum4U Precision Health Registry

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Objectives: To understand how patients with inflammatory arthritis (IA) currently obtain access to mental healthcare resources and identify strategies to enhance support during rheumatology clinic visits.

Methods: Patients and healthcare providers participated in semi-structured interviews or focus groups. Patients were recruited from the Rheum4U Precision Health Registry using purposive sampling. Healthcare providers from two rheumatology clinics were approached in-person or by email to participate. Prior to interviews/focus groups, participants completed a survey with closed-ended questions about mental healthcare resources. The interviews/focus groups explored the use of mental health screening questionnaires and experiences of patients accessing mental healthcare resources themselves or through healthcare providers. Cognitive task analysis [1] and service blueprinting [2] organized and mapped current practices. The analysis will be used to create recommended care pathways, which will be later reviewed for feedback by participants.

Results: Six patients and three rheumatologists participated in interviews. Two allied health professionals and five nurses participated in interviews or focus-groups. Four patients reported having anxiety/depression, four patients indicated they never discuss their mental health at rheumatology clinic visits, and none of them were using any mental healthcare resources at the time. All healthcare providers have referred patients to mental health resources and almost all would like to discuss their patients' mental health. Key findings included: Patients with strong social-support networks did not require assistance from healthcare providers to access resources. Some patients preferred to get assistance at the rheumatology clinic, while others consulted their general practitioner (GP), or were unsure of where to seek help for mental health concerns. After inquiring about mental health, clinic staff would refer patients to the social worker or provide relevant information. Some rheumatologists screened patients themselves to assess needs and resources and sometimes referred them to the social worker. Commonly used resources included employment assistance programs, community resources, mental health websites, and crisis lines. Rheumatologists sometimes informed their patient's GP about mental health concerns through summaries sent via the electronic medical record system but follow-up communication was often lacking. Figure 1 depicts a summarized journey of how patients with IA currently receive support for mental health concerns.

Conclusion: Access to mental health resources for patients with IA varies significantly. Streamlining support for patients could involve allied health professionals assisting rheumatologists with screening, developing a quick reference guide with available resources, and enhancing communication between involved healthcare providers to ensure continuity of care.

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Engaging Community Pharmacy as Part of a Multidisciplinary Preventive Care Approach

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Objectives: Preventive care is a crucial aspect of patient management in rheumatology. Whether it is initiating antiresorptive therapy to reduce fracture risk, lipid panel verification for cardiovascular disease prevention, or ensuring adequate vaccination for patients on immunosuppressive therapy; preventive interventions are a key part of rheumatology practice. In this quality improvement study, rheumatologists and rheumatology nurse clinic members implemented a referral service engaging community pharmacy deliver preventive care for patients with a noted concern.

Methods: Inclusion: Patients >18, seen at the South Health Campus Rheumatology clinic, and a relevant concern in osteoporosis management, cardiac risk management, routine vaccination, tobacco cessation, or other ambulatory care issue (ex. Diabetes). Patients were referred using a common referral form designed by the nursing clinic. Referrals were sent to the regional Co-op Specialty Hub with pharmacists trained in preventive concerns for rheumatology patients. Pharmacist reports were reviewed to determine pharmacist interventions.

Results: 36 patients were referred for pharmacist preventive care, 1 declined to participate. Rheumatologists sent 21 referrals and the nurse clinic sent 15. The average time to pharmacist appointment was 10.12 days (median 8 days, range 1-44). On average 4.3 (range 1-9) pharmacist interventions were performed for each referred patient. 3/35 of patients did not have family physicians; they received an average of 8 pharmacy interventions.The most common referrals were for osteoporosis and cardiovascular risk management (25/35 each). For osteoporosis management, the most common interventions were FRAX scoring (15/25), non-pharm patient education (14/25), and sending BMD requests (9/25). Pharmacists initiated 4 patients on bisphosphonates. For cardiovascular risk management, the most common interventions were Framingham risk scoring and non-pharm patient education (13/25 each). Statins were initiated in 5 patients and 5 drug-related problems were identified (i.e. 3 cases of suboptimal statin or antihypertensive dosing, 2 relevant interactions). For routine vaccination, rheumatology team members noted 25 outstanding vaccines for 11 patients. The pharmacists were able to administer 5 vaccines to these patients. Other ambulatory care issues which were addressed by pharmacy included smoking cessation (5/35) and diabetes management (3/35). To date, 12/35 patients have had at least 1 follow-up with community pharmacy for ongoing management (9/12 for cardiovascular risk-related issues).

Conclusion: In this study we found that community pharmacists were able to provide requested preventive health services as part of a multidisciplinary referral service. Follow-up studies will look at gauging the impact of these services longitudinally based on previous literature. [1,2,3]

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Text-Based Messaging to Support Rheumatoid Arthritis Care: an Analysis of the

Frequency and Content of Text Messages

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Objectives: Rheumatoid arthritis (RA) requires regular follow-up appointments with rheumatologists to monitor disease activity, however, this may be difficult to achieve due to physician and patient schedules and a limited rheumatology workforce.1 Virtual care has been used to improve health care delivery by connecting patients with healthcare providers (HCPs).2 In this study, it was used to enhance RA care by allowing patients to connect with their rheumatology team in between appointments on a secure two-way text-messaging platform called WelTel. The objectives of this study were to 1) analyze the frequency and content of text messages sent by patients to their HCPs, and 2) to determine patient characteristics that were associated with higher texting frequency.

Methods: Seventy participants diagnosed with RA participated in a 6-month pilot using the WelTel platform. Automated "How are you?" texts were sent monthly, and participants were encouraged to respond according to their current situation. Participants could also initiate messages if they had questions/concerns between appointments. Text messages were monitored and answered primarily by the clinical pharmacist for the rheumatology clinic. Qualitative content analysis was conducted to thematically categorize and quantify common words and phrases. Once categories were quantified and themes were established, regression analysis was conducted to determine if a relationship existed between the number of text messages and age, sex, care complexity level, number of medications, and burden of comorbidities. Care complexity was measured using the Intermed Self-Assessment, a validated patient-reported instrument that assesses biopsychosocial complexity.

Results: A total of 1404 text messages were sent by patients with 257 messages requiring a response from the participating pharmacist. Three main content themes were identified: RA symptoms, medication questions, and COVID-19 concerns. There was a significant association between text messaging frequency and patient care complexity levels ($p = 0.025$), however, no association was identified between text messaging frequency and age, sex, number of medications, or burden of comorbidities.

Conclusion: The present study piloted the novel use of text messaging using the Weltel virtual care platform for providing additional RA care in between rheumatologist visits. Our analysis identified the common concerns that patients raise with their care team via messaging. The content of text-messages received was highly relevant and directly related to patient care needs. Patient care complexity was associated with significantly more text-messages to discuss health concerns, highlighting a population who may benefit in particular from the intervention.

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Negative Health Impacts of Navigating the Healthcare System for Musculoskeletal Conditions: Healthcare User Perspectives

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Objectives: Musculoskeletal (MSK) disorders pose a significant public health challenge, affecting patient quality of life, productivity, and healthcare costs. While the negative impacts of living with chronic MSK conditions are well-studied, the health impacts associated with navigating the healthcare system for MSK care remain underexplored. The objective of this research is to explore patients' experiences of navigating the healthcare system for (soft tissue) knee, shoulder, and lower back conditions and understand the connections between aspects of health system navigation and negative health impacts.

Methods: This qualitative study used interpretive description methodology to explore patients' experiences with the MSK healthcare system for knee, shoulder, and lower back issues. Data were collected from November 2022 to December 2023 through one-on-one semi-structured telephone interviews. Interviews were transcribed and analyzed using framework analysis. The study received ethics approval from the University of Calgary Conjoint Health Research Ethics Board (REB22-0881).

Results: 73 individuals (61.6% female, 47.5 median age) participated in the study. Over half of participants experienced negative health impacts due to navigating the MSK healthcare system. Reported issues included physical decline (debilitation, new symptoms), mental health challenges (depression, anxiety, loss of self, disempowered)), and prolonged suffering (pain, suicidal ideations). Contributing factors were lack of access to effective treatments, lack of compassionate care, perpetual waiting, care discontinuity, and lack of provider knowledge.

Conclusion: The findings highlight systemic issues that worsen patient health and hinder well-being, emphasizing the need for comprehensive MSK healthcare reform. A well-integrated, patient-centered system is crucial for optimizing care delivery and empowering patients in their MSK care. Policymakers and healthcare administrators must address these systemic barriers to improve accessibility, care integration, and continuity. Future research should assess the systemic impacts of healthcare navigation on patient health and satisfaction.

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Patient Engagement and Empowerment Using a Mhealth Application for Management of Inflammatory Arthritis

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Objectives: Despite the rise of mHealth applications for inflammatory arthritis, research on patient-reported outcomes related to usability and confidence in disease management is limited.

While mHealth tools can improve self-management and patient-provider communication in chronic conditions, their impact on patient empowerment in arthritis remains underexplored. This study aims to address this gap by evaluating the "Arthritis+Patient" mHealth app, focusing on usability, self-management, and empowerment.
Methods: The "Arthritis+Patient" app, developed by Dr. Mulgund from Trillium Health Partners and available for free download, was evaluated through two cross-sectional surveys. The first survey, adapted from the Post-Study System Usability Questionnaire, evaluated user experience and was administered to 73 patients diagnosed with inflammatory arthritis by a rheumatologist between January 2019 and January 2024. A second survey on arthritis self-management was administered to 16 patients. We included patients from 3 community rheumatology clinics who consented to survey completion. Data were collected in-office, either electronically or on paper, and descriptive statistics were used for analysis. There was some missing data, and denominators were provided accordingly.
Results: Among the 73 usability survey respondents, 81.9% (n = 59/72) agreed the app's interface was user-friendly, and 83.5% (n = 61/73) found it easy to understand and navigate. Regarding health management, 69.8% (n = 51/73) found the app useful, and 62.5% (n = 45/72) reported increased confidence in managing their condition. Moreover, 70.8% (n = 51/72) intended to continue using the app, and 72.6% (n = 53/73) would recommend it. Of those who completed the self-management survey (n = 16), 86.7% (n = 13/15) found the educational material useful. App features for tracking medical history, and managing sleep and anxiety were valued by 92.3% (n = 12/13) and 69.2% (n = 9/13) of respondents, respectively. Additionally, 50% (n = 7/14) reported improved tracking of arthritis between appointments, and 28.6% (n = 4/14) felt more confident in decision-making. Most patients (75%, n = 9/12) noted feeling empowered through active symptom tracking and 50% (n = 7/14) used the app 1-2 times per week. Free-text feedback suggested adding trend tracking for symptoms.
Conclusion: The "Arthritis+Patient" app shows potential for enhancing patient engagement, empowerment, and self-management in inflammatory arthritis care. Usability and educational content were well-received, with users reporting increased confidence in disease management. Integrating mHealth apps into routine arthritis care could improve patient-centered outcomes and support quality improvement in health services.

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Prioritizing Patient-Reported Outcome Measures for Routine Collection in Rheumatoid Arthritis: an Integrated Consensus-Building Process with Patients and Health Care Providers

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Research Canada, Calgary)

Objectives: Patient-reported outcome measures (PROMs) are essential tools for prioritizing patient-centered care. Effective use of PROMs collected in clinical care hinges on selecting appropriate measures. The aim of this study was to establish consensus on PROMs for routine collection in RA care based on Canadian patient and provider preferences.

Methods: Candidate PROMs were identified through an environmental scan. Candidate PROMs met the following criteria: 1) clinical and/or research evidence supporting their use, 2) valid psychometric properties, 3) available at no cost, and 4) feasible to complete in routine care. We adopted a dual-panel consensus-building approach with a patient-exclusive panel, and separate engagement with rheumatology healthcare providers (HCPs). Consensus among patients with RA was established via a modified Delphi, co-led with two patient partners. This began with a prioritization of health domains/outcomes for review (Round 0). PROMs were then rated using a Likert scale of 1-9 for content validity, importance, and feasibility (Round 1), followed by a virtual consensus-building discussion (Round 2), and final re-rating of PROMs (Round 3). HCPs were engaged in a two-part rating and discussion exercise with two groups of providers from Alberta academic centres. Consensus was achieved if PROMs received a median rating of 7 or higher in at least two criteria. We included a ranking exercise for highly rated PROMs (>7 in all three criteria) in the final patient panel round. An overall rank was assigned to PROMs based on the rank-weighted sum.

Results: Fifteen patients with RA, took part in the Delphi rounds. From an initial set of 15 candidate PROMS, 10 were rated highly (≥ 7) across all three criteria in Round 3. These PROMs were subsequently ranked. A measure of physical function ranked highest. Among HCPs (n=23), four PROMs received a median rating of 7 or higher in at least two criteria. Though limited, there was agreement between patients and HCPs ratings for pain and fatigue PROMs. Of these, only pain interference was highly ranked by patients (Table 1). Feedback from providers suggests that PROMs should align with clinical documentation needs, including insurance forms for advanced therapies and disability claims.

Conclusion: Given the limited agreement between patients and providers on PROM measurement priorities, further work is required to understand why and to select a meaningful set of PROMs for routine collection. To start, a measure of physical function will be initialized for routine collection as it is a high patient priority and supports HCPs clinical documentation.

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It’s Not Always the “case”

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Case Presentation: We present a 64-year-old male with a complex medical history, diagnosed with SLE/scleroderma (SSc) overlap. He exhibited photosensitive rashes, Raynaud's phenomenon, telangiectasis, and arthritis. The patient had previously shown intolerance to several immunosuppressive agents, including hydroxychloroquine, mycophenolate mofetil, and azathioprine. Initial treatments with Benlysta (belimumab) and chloroquine were effective but lost efficacy by 2020. He developed painful, ulcerated mucocutaneous lesions with purplish borders and inflamed mucosa over his arms and back.

Diagnosis: Serological testing revealed positive ANA, anti-Sm, and anti-RNP antibodies, alongside elevated inflammatory markers (ESR and CRP). Skin biopsy in November confirmed the diagnosis of Acquired porforated dermatosis.

After conventional therapies failed, the patient was treated with allopurinol, resulting in significant improvement in skin lesions and associated symptoms. By May 2024, most lesions had healed, and his quality of life improved.

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A New Look into Ultrasound of the Facial and Subclavian Arteries in Patients Suspected with Gca: a Real-World Assessment

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Objectives: In diagnosing giant cell arteritis (GCA), Canadian rheumatologists have extensive experience in using Doppler ultrasonography (US), fueling the debate about favoring it over the standard temporal artery biopsy. It remains unclear whether evaluating extracranial arteries in addition to temporal and axillary arteries significantly improves the diagnostic threshold (6). The primary objective was to analyze the pattern of US abnormalities in GCA and test the benefit of adding facial and subclavian arteries in the GCA assessment. The secondary objective was to evaluate the effect of prior glucocorticoid therapy on negating US findings.
Methods: Patients who underwent US assessment at the Centre Hospitalier Universitaire de Sherbrooke between 2021 and 2022 were included in the study. Arteries findings, symptoms, steroid treatment and the suggested diagnosis were written in the report, which we contrasted with the diagnosis recorded by the referred rheumatologist. Other clinical data and investigations done by the primary clinician were collected descriptively through the patient chart. Discrimination estimates were then calculated according to the artery findings.
Results: Most of the 51 subjects in this study were female aged 76 years old and 72,6% had already started a steroid treatment before the US. 19 had positive US findings, with the temporal artery making up the most positive cases. More patients had been diagnosed with GCA than positive ultrasound findings, which is explained by later investigations, such as a biopsy and PET scans. Sensitivity, specificity, positive predictive and negative predictive value were comparable for most combinations of surveyed arteries: 72.0%, 100%, 100% and 78.8% respectively. Adding facial or subclavian arteries to the standard temporal and axillary arteries evaluation did not improve biostatistical parameters. When comparing those with halo signs on the US to those without, 89.5% of the former and 62.5% of the latter were on corticosteroids, showing a p-value < 0.05.
Conclusion: Our study suggests that there was no improvement in the sensitivity, specificity, PPV and NPV when adding facial and/or subclavian arteries to the conventional temporal and axillary arteries. Our overall findings support previously reported biostatistics and the role US in GCA. The delay of active corticosteroid treatment for GCA can impact the US evaluation.

Further research on the matter in a more controlled environment will contribute to the advancement of the use of US in rheumatology.

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Salmonella Septic Arthritis and Osteomyelitis in Patients Receiving Tumour Necrosis Factor Alpha Inhibitors

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Objectives: Tumour necrosis factor (TNF) alpha inhibitor therapies are used worldwide to treat a variety of rheumatic diseases. However, they are also associated with serious infections. This review summarizes and critically appraises the literature surrounding Salmonella musculoskeletal infections in patients receiving TNF alpha inhibitors. The objective of this review is to raise awareness of the risk of Salmonella septic arthritis and osteomyelitis in patients receiving TNF alpha inhibitors. Potential pathophysiologic and immunologic mechanisms are discussed.

Methods: The MEDLINE, EMBASE, and Google Scholar Databases were searched for this review. Relevant keywords and MeSH terms were incorporated in conjunction with Boolean operators to retrieve appropriate peer-reviewed articles. The reference lists of the most relevant articles were searched manually for additional articles of relevance.

Results: Twelve reports of Salmonella septic arthritis and four reports of Salmonella osteomyelitis were discovered among patients receiving TNF alpha inhibitors. There was considerable variation with respect to onset of infection after therapy initiation, underlying indication for TNF alpha inhibitor therapy, the type of TNF alpha inhibitor used, and long-term outcome. The knee joint was the most common site of musculoskeletal infection, and rheumatoid arthritis was the most common underlying indication for TNF alpha inhibitor therapy. Most patients required at least one invasive procedure and extended antimicrobials as part of therapy. When specified, all reports indicated discontinuation of TNF alpha inhibitor therapy after identification of infection. The critical role of TNF alpha in necroptosis and pyroptosis likely allows intracellular pathogens such as Salmonellae to thrive upon TNF alpha inhibition.

Conclusion: TNF alpha inhibitors are used worldwide to treat a variety of rheumatic diseases. However, TNF alpha inhibitors are associated with serious infections, including atypical musculoskeletal infections. An important yet under-recognized pathogen that can cause musculoskeletal infections in patients receiving TNF alpha inhibitors is Salmonella, with several reports identified in the recent literature. We hypothesize that TNF alpha blockade disrupts the innate immune response against intracellular pathogens, in turn providing Salmonellae a golden opportunity to thrive. Importantly, the identification of Salmonella musculoskeletal infection had significant clinical implications, often requiring extensive medical and/or surgical management and interruption of TNF alpha inhibitor therapy. Clinicians should be aware of the risk of Salmonella infections in patients starting or currently receiving TNF alpha inhibitors. Patients receiving TNF alpha inhibitors should be counseled regarding best practices for reducing risk of contracting Salmonella infection, such as avoiding high risk foods and being vigilant while traveling abroad.

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Fracture Risk Associated with Immune Checkpoint Inhibitors: a Systematic Literature Review and Meta-Analysis

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Objectives: Immune checkpoint inhibitors (ICIs) have caused a paradigm shift in treating numerous malignancies. While ICIs work by activating T lymphocytes to attack tumor cells, they may inadvertently promote osteoclast activation as an off-target effect, leading to osteoporosis development and fragility fractures. Randomized controlled trials (RCTs) assessing ICIs do not consider fractures as immune-related adverse events (irAEs), with fracture data solely available in supplementary appendices. Additionally, the infrequent occurrence of fractures makes meaningful risk analysis difficult within a given RCT. Objective: To conduct a systematic literature review (SLR) and meta-analysis to determine fracture risk associated with ICI.

Methods: We conducted an SLR and meta-analysis of phase II and III ICI RCTs in patients with solid cancers. We performed a search using Medline and Embase from inception to June 12, 2024. All studies were independently reviewed by two researchers at each stage of screening and conflicts were resolved by a third reviewer in Covidence. We reviewed the supplementary materials at the full text review stage and included studies which reported fracture events. Fractures were categorized as any fracture and major osteoporotic fracture (MOF) (vertebrae, forearm, hip, and humerus). Random effects meta-analysis were performed to determine the overall risk of any fracture and MOF in ICI users as compared with non-ICI users and heterogeneity was assessed using Cochran's Q test. Subgroup analysis was performed on placebo-controlled RCTs.

Results: We screened 5050 titles and abstracts, 424 full text articles, and identified 33 studies that met our inclusion criteria. The overall relative risk (ORR) of any fractures was 1.008 (95% CI 0.711 to 1.430, p-value=0.963) and the ORR of MOF was 1.048 (95% CI 0.673 to 1.630, p-value=0.837). The ORR of MOF for the 17 placebo-controlled studies was 1.25 (95% CI 0.62 to 2.52 , p-value=0.870) as shown in the forest plot. The I2 statistic showed no heterogeneity among the studies, with consistent values of 0.0%.

Conclusion: There is no statistically significant increased fracture risk between ICI-users and non-ICI users during the active treatment period in ICI RCTs. However, the overall effect estimate shows a trend towards higher risk of fractures, particularly MOFs in ICI users, which was most pronounced in the placebo-controlled RCTs. These non-significant results may be related to limited number of reported events and short duration of adverse events monitoring. Longer monitoring of adverse events could yield more comprehensive data, allowing for more precise assessment of the fracture risk.

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Management of Osteoporosis in Patients with Rheumatoid Arthritis: Insights from a Canadian Academic Division of Rheumatology

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Objectives: Despite compelling evidence for efficacy of osteoporosis (OP) treatment, fewer than 20% of patients experiencing a fragility fracture receive therapy in Canada. Given the links between rheumatoid arthritis (RA) and bone loss, we report the initial results of a quality improvement (QI) initiative at optimizing OP care as a comorbidity in RA patients in our rheumatology center.
Methods: This retrospective cross-sectional study primarily recruited RA patients aged 50+ from the observational Early Undifferentiated PolyArthritis (EUPA) cohort who had been followed by a rheumatologist for at least one year between January 2021 and December 2023. Outcomes were analyzed using the three-level Fracture Risk Assessment Tool (FRAX). Patients with bone metabolic disorders other than OP were excluded.
Results: Ninety-four patients were analyzed: 56 were female (59.6%), with a median age of 68.4 (IQR 62.9-76.2). Median disease duration was 84.4 months (IQR 47.5-120.4), and the median HAQ score at last follow-up was 0.125 (IQR 0-0.625). Erosive disease was present in 23 patients (24.5%), and 45 (47.9%) were seropositive. Nine (9.6%) were active smokers. Eleven patients (11.7%) had significant steroid exposure in the last year (prednisone 5mg daily for 3+ months or equivalent). At last follow-up, 45 patients (47.9%) were on vitamin D and 32 (34.0%) on calcium, and 25 (26.6%) had their 25-OH vitamin D levels checked in the last two years. In the last five years, 17 patients (18.1%) had a bone mineral density (BMD) whereas six (6.4%) had C-terminal telopeptide (CTX) serum levels measured. At last follow-up, using FRAX with BMD adjustment when available, 42 patients (44.7%) were high risk, nine (9.6%) were medium risk, and 36 (38.3%) were low risk. Table 1 describes OP care data according to risk categories. Anti-resorptive medication was taken by seven high-risk (16.7%), three medium-risk (33.3%), and two low-risk (5.6%) patients, with no statistical difference (p=0.064). Twelve patients (12.8%) had osteoporotic fractures: ten were high-risk and one was medium-risk (one had missing data on FRAX). Six had major osteoporotic fractures: four occurred in the last 2 years, three of whom received anti-resorptive medication.
Conclusion: OP care for RA patients in our center is currently below Canadian standards, with a low proportion of high-risk fracture patients adequately managed. However, FRAX's limitations include not considering fracture timing or RA activity in the evaluation. Initiatives are planned in the next steps of this QI project to raise rheumatologists' awareness and enhance OP care in RA.

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Evaluating Access to Care Indicators of Jia Patients in Southwestern Ontario

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Objectives: Delays in initial consultation for patients with newly diagnosed juvenile idiopathic arthritis (JIA) are associated with worse outcomes (1). Canadian benchmarks exist for acceptable

wait times for initial consultation in JIA; non-systemic JIA patients should be seen within 4 weeks (2). We sought to identify gaps in access to care in Ontario to plan for a province wide quality improvement project. This study aimed to establish baseline measures for access to care indicators for patients with newly diagnosed JIA at pediatric rheumatology centers in Southwestern Ontario.
Methods: A retrospective chart review was completed for patients with non-systemic JIA assessed by Pediatric Rheumatology for consultation between January 1 - June 30, 2024 at McMaster Children's Hospital or Children's Hospital, London Health Sciences Centre. Descriptive statistics were used to analyze wait times, patients meeting benchmarks, and general access to care measures.
Results: Twenty-one patients with newly diagnosed JIA were assessed during the first half of 2024. The median (IQR) wait time from referral to consultation was 16 days (IQR=9-30) and the 90th percentile wait time was 50 days. The wait time benchmark was achieved in 71.4% of patients with newly diagnosed JIA. There was regional variation in meeting the wait time benchmark between Hamilton (53.3%) and London (88.9%). No patients missed or rescheduled their initial consultation visit. Patients with newly diagnosed JIA saw a median of 2 medical providers prior to pediatric rheumatology. The average distance travelled to the pediatric rheumatology center was 55.6 km. The percentage of patients meeting the wait time benchmark were similar for those living within 25 km (85.7%), between 25-75 km (60%), and >75 km (75%).
Conclusion: Overall, the wait times for pediatric rheumatology consultation are reasonable for patients with newly diagnosed JIA; however, almost 30% of patients were not seen within the recommended benchmark. With the existing triage processes in Southwestern Ontario, patient distance from the care center did not seem to affect timely access to care. Regional variation exists between Pediatric Rheumatology sites and process mapping the triage workflow could help better understand factors contributing to these regional differences. Our next step will be the inclusion of the additional Pediatric Rheumatology academic centers in Ontario. A potential candidate for a province-wide quality improvement project is increasing the percentage of new JIA patients, currently 71.43%, being seen within the recommended wait time benchmark.

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The Association Between Body Composition and Treatment and Disease Outcomes in Patients with Juvenile Idiopathic Arthritis: Results from the Capri Registry

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Children's Hospital/University of Calgary, Calgary); Jaime Guzman (Division of Rheumatology, Department of Pediatrics, BC Children's Hospital & University of British Columbia, Vancouver); Michelle Batthish (McMaster University, Hamilton); CAPRI Registry Investigators (Vancouver)
Objectives: Recent evidence has linked abnormal body weight, underweight or obesity, with poor disease outcomes in adults with inflammatory arthritis. Yet, little is known about potential similar associations in children with JIA. Therefore, we investigated the association between BMI categories and time to start treatments and attain disease outcomes in children with JIA.
Methods: Data were captured prospectively through the Canadian Alliance of Pediatric Rheumatology Investigators (CAPRI) JIA Registry. This national research registry follows newly diagnosed patients with JIA and collects data at each clinic visit. Based on age, sex, height, and weight at enrolment, BMI was categorized for each patient as underweight (<5thpercentile), healthy (5th to <85th percentile), overweight (85th to <95th percentile), or obese (≥95th percentile) according to the WHO growth charts. For each BMI category, Kaplan–Meier curves examined time to clinical Juvenile Arthritis Disease Activity Score 10 (cJADAS10) ≤1, pain score (parent and patient reported) <1, quality of life (patient reported) >9, parent global assessment <1, physician global assessment <1, and active joint count <1. For these disease outcomes, shorter times are considered optimal. Time to start treatments included conventional DMARD, biologic DMARD, joint injections, and systemic corticosteroids. Log-rank tests compared outcomes across BMI categories; healthy served as the reference category.
Results: We included 759 patients enrolled in the Registry between February 2017 and May 2023 (61% female; mean±SD age 9.5±4.7 years). The obese group took significantly longer to attain cJADAS10 ≤1 ($\chi2(1)=5.53$, $p=0.019$, median difference in time to reach outcomes compared to reference category [MD]=36 weeks), parent pain score <1 ($\chi2(1)=5.90$, $p=0.015$, MD=46 weeks), and parent global assessment <1 ($\chi2(1)=5.49$, $p=0.019$, MD=11 weeks). Time to first DMARD was significantly shorter in obese patients ($\chi2(1)=4.34$, $p=0.037$, MD=15 weeks), and time to first biologic was significantly shorter in underweight patients ($\chi2(1)=4.65$, $p=0.031$, MD=185 weeks) [Figure 1 A-E]. No other examined treatments or outcomes were significantly different between BMI categories.
Conclusion: Children with JIA in the obese group took longer to attain disease control based on both clinical and parent-reported outcomes compared to those with healthy BMI, despite earlier treatment escalation to DMARDs. Additionally, those who were underweight also required earlier treatment escalation to biologics. Further analyses will explore weight percentile groups, covariates including ethnicity and JIA subtype, and changes in body composition overtime. Altogether, these findings may help inform clinicians on anticipated treatment responses and disease outcomes when educating and counseling families about body composition.

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Mental Health Screening in Pediatric Rheumatology: A Feasibility Study

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Objectives: The aims of this study were: (1) to determine the acceptability and practicality of mental health screening in patients with Juvenile Idiopathic Arthritis (JIA) during routine visits at a pediatric hospital multidisciplinary clinic; (2) to understand the frequency and severity of anxiety and depressive symptoms within this sample.

Methods: Patients with JIA aged 8-17 were invited to participate during their routine clinic appointments. Recruited participants completed three questionnaires on an iPad: PROMIS Pediatric Anxiety (v3), PROMIS Pediatric Depression (v3), and a short questionnaire regarding the acceptability of the screening process. Caregivers then completed a short questionnaire regarding the acceptability of the process. Our occupational therapist provided participants with feedback on their PROMIS scoring profile and relevant mental health resources during their clinic visit.

Results: Forty patient-parent dyads were recruited during routine follow-up appointments at the Rheumatology Clinic at BC Children's Hospital between April and August 2024 (mean patient age = 13.5 years; 23 females). Another 26 families were approached but declined, primarily due to time constraints. The mean PROMIS Anxiety t-score was 51.79 (SD=11.06) and the mean PROMIS Depression t-score was 50.54 (SD=7.62), both similar to the general population (mean=50 SD=10). Six patients (15%) had elevated or very elevated anxiety scores, and two patients (5%) had elevated depression scores. Overall, 92% of patients and 95% of caregivers reported the screening process to be 'Acceptable' or 'Completely Acceptable', while 57% of patients and 87.5% of caregivers reported that the rheumatology team should check in about mental health. Most patients (87.5%) reported it took 'No effort at all' or 'A little effort' to complete the questionnaires. Ninety percent of caregivers reported they were 'Very Comfortable' or 'Comfortable' with their child completing the questionnaires. Patient and parent responses regarding the ideal frequency of the screening were evenly split between every visit, every six months and every year.

Conclusion: There was high acceptability of the mental health screening process among patients and caregivers. A greater percentage of caregivers compared to patients thought that the rheumatology team should check in about mental health during routine clinical visits. Most patients considered it took little additional effort to complete the questionnaires. The mean anxiety and depression scores were similar to the general population with a small proportion reporting elevated scores. Mental health screening is feasible within routine rheumatology clinic visits and should be considered by health professionals providing care for youth with JIA.

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Psoriatic Arthritis Before Psoriasis: Patient Characteristics and Transition Rate

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Objectives: Psoriatic arthritis (PsA) is a heterogeneous inflammatory disorder affecting skin and

multiple musculoskeletal domains. While cutaneous psoriasis precedes arthritis in most patients, approximately 7-15% of PsA patients are diagnosed prior to the onset of psoriasis. This statistic was identified based on UK registry data (1), and few studies have corroborated the estimate, nor further characterised this patient subset. We aim to characterise the baseline characteristics of patients presenting with PsA prior to psoriasis, determine the incidence of psoriasis after PsA diagnosis and factors contributing to risk of psoriasis after PsA.
Methods: This is a retrospective analysis of prospectively collected data from the Gladman-Krembil Psoriatic Arthritis Program cohort, with an enrolment of 1689 PsA patients at the time of the study, all of whom were diagnosed with PsA and meet CASPAR criteria. Subjects with an onset of PsA preceding psoriasis at cohort entry, or those with no known psoriasis, were identified. The latter underwent chart review to identify the time of psoriasis onset. Baseline characteristics were then compared to the rest of the cohort, who had a psoriasis onset preceding or simultaneous with PsA. A multivariate cox regression of time-independent covariates was used to identify factors influencing the incidence of psoriasis after PsA.
Results: 116 total patients were identified; 29 did not have known psoriasis at cohort entry and the remainder had established PsA preceding psoriasis at cohort entry. The incidence of psoriasis following PsA is 9.2 cases per 100 person-years; however, the incidence reduced over time. Compared to PsA after psoriasis, patient with PsA before psoriasis (Table 1) were younger at PsA diagnosis (35.69 years vs. 38.86 years, p=<0.017), less likely to have nail involvement (43.0% vs. 65.7%, p=<0.001), more likely to have erosions (68.9% vs. 51.6%, p=0.001) and more radiographic damage at presentation (Modified Steinbrocker score 4.00 vs 2.00, p=<0.001). In the multivariate cox regression model, use of bDMARD (HR 0.24, 95% CI [0.11- 0.53], p =<0.001) or NSAIDs (HR 0.54, 95% CI [0.35-0.90], p=0.017) was associated with a lower risk of psoriasis. Male sex was associated with a higher risk of psoriasis (HR 1.67, 95% CI [1.07-2.62], p=0.024).
Conclusion: Patients presenting with PsA prior to onset of psoriasis are younger at PsA diagnosis and more likely to sustain joint damage. This could suggest the absence of psoriasis leads to delayed diagnosis and treatment. The use of bDMARDs or NSAIDS, but not cDMARDs was associated with reduced risk of psoriasis after PsA.

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Causal Association Between Peripheral Blood Immune Cells and Spondyloarthritis Phenotypes.

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Objectives: Complex genetic signatures in immune cells underlie SpA phenotypes, including axial SpA and psoriatic disease. Recently, GWAS data for these 731 immune traits can be found in the IEU Open GWAS project from a cohort of 3,757 Sardinians noted 122 significant independent association signals, over 40% overlapped with autoimmune disease. However, a possible causal relationship between immune cells and disease cannot be determined. To evaluate the causal association between immunological characteristics and ankylosing spondylitis (AS), psoriatic arthritis (PsA), and psoriasis (PsV) , a bidirectional, two-sample Mendelian randomization (MR) approach was performed in this study.

Methods: 1462 pts with AS, 1553 pts with PsA, and 4510 patients with psoriasis were analyzed. The control population ranged from 147,221 to 212,242 samples, and over 16 million SNPs were used in the analysis. Instrument selection for MR included single-nucleotide variations (SNVs) with a genome-wide significance threshold of $5 \times 10{-}8$ for AS, PsA, and PsV and a Genome-wide significance threshold of $5 \times 10{-}6$ for immune traits. MR was assessed using the Inverse variance weighted (IVW) method.
Results: For immune cells leading to AS, the top two associations were HLA-DR on CD14-CD16+ monocytes [OR 0.66 (0.54-0.8200, p=0.00010] and HLA DR+CD4+ T cell absolute count [OR 1.77 (1.25-2.49), p=0.00117]. For immune cells leading to PsA, the top two associations were CD8 on terminally differentiated CD8+ T cell [OR 1.33 (1.15-1.53, p=.00009] and Hematopoietic Stem Cell Absolute Count [OR 1.13 (1.04, 1.24), p=0.00432]. Finally, for immune cells leading to psoriasis, the top two associations were CD28-CD4-CD8- T cell absolute count [OR 0.89 (0.83-0.95), p=0.00069] and CD8 on terminally differentiated CD8+ T cell [OR 1.19 (1.07-1.32), p=0.00099]. The p-values reported are not corrected for multiple testing.
Conclusion: Multiple immune cells leading to SpA phenotypes have been identified. Some of these cell types, such as HLA-DR on CD14-CD16+ monocytes and double negative T cells (CD4-CD8-), have already been implicated in the pathogenesis of SpA. Further interrogation of the data may help link specific immune cell subtypes to immune-mediated disorders, identify candidate causal candidate genes, establish the direction of effect, and offer new insight into the pathogenesis of the disease.

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Guselkumab and Il-17 Inhibitors Show Comparable Treatment Persistence and Effectiveness in Psoriatic Arthritis: 6-Month Interim Results of the Psabiond Observational Cohort Study

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Objectives: Many drugs are available in PsA and have demonstrated efficacy in randomized controlled trials (RCTs); however, real-world long-term data of drugs are scarce. PsABIOnd is a

large, ongoing, global observational study in PsA. The aim of this interim analysis of the first ≥600 participants (pts) enrolled out of 1300 planned pts in PsABIOnd was to assess treatment persistence and achievement of clinical PsA outcomes at 6 months (M).
Methods: PsABIOnd (NCT05049798) is an ongoing observational study in PsA pts starting guselkumab (GUS) or IL-17 inhibitors (i) as 1st-to-4th line of biologic therapy (monotherapy or in combination with other agents) per standard of care. The primary outcome is treatment persistence at 36M [1]. In this interim analysis, the subset of pts enrolled in the PsABIOnd study who had an assessment at the 6M visit (+/-3M) were analysed according to their initial treatment, regardless of later switches. Persistence on treatment (i.e., no stop or switch) was assessed over 6M via the Kaplan-Meier estimator function. Propensity score (PS) analysis was used to evaluate hazard ratio of stopping or switching GUS vs IL-17i prior to the 6M visit, adjusting for baseline (BL) imbalances across cohorts. Effectiveness was assessed at the 6M visit (descriptive unadjusted reports) by treatment line and included rates of achievement of Low Disease Activity (LDA)/remission (REM) by clinical Disease Activity Index for PsA (cDAPSA) and DAPSA, minimal disease activity (MDA), psoriasis body surface area (BSA)<3%, resolution of enthesitis by Leeds Enthesitis Index and dactylitis.
Results: As of 08-Jan-2024 (cutoff date), 360 and 326 pts receiving GUS or IL-17i, respectively, as their initial treatment had follow-up data at the 6M visit: mean (GUS/IL-17i) age at BL was 52.0/53.6 years, and 63.1%/63.8% pts had previously received ≥1 targeted drug. Treatment persistence at the 6M visit was high, with 339/360 (94.2%) GUS pts and 304/326 (93.3%) IL-17i pts remaining on their initial treatment line (PS-adjusted hazard ratio of GUS vs IL-17i stop/switch [95% confidence interval (CI)]: 0.87 [0.47-1.61]). Reasons for initial treatment line discontinuation were comparable between groups. Treatment effectiveness was similar for GUS vs IL-17i at the 6M visit (Fig 1), with similar rates of pts achieving cDAPSA LDA/REM, DAPSA LDA/REM, BSA<3%, MDA, LEI resolution, and dactylitis resolution.
Conclusion: PsA pts had similar persistence on treatment with GUS or IL17i, and comparable rates of effectiveness across various PsA domains at 6M. These results provide additional information on real-world effectiveness and support efficacy data from RCTs.

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Guselkumab and Il-17 Inhibitors Improve Patient-Perceived Impact of Psoriatic Arthritis Similarly: 6 Month Interim Results of the Psabiond Observational Cohort Study

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Objectives: Targeted drugs in PsA have demonstrated efficacy in randomised controlled trials, including aspects of patient-reported impact. However, comparison data from observational studies are scarce, particularly for IL-23 and IL-17 inhibitors (i). As part of the 6 month (M) interim analysis of the first ≥600 participants (pts) enrolled in the PsABIOnd observational study, we assessed changes from baseline (BL) in PsA Impact of Disease-12 (PsAID-12) following biologic treatment initiation.
Methods: PsABIOnd (NCT05049798) is an ongoing international, prospective study in 1300 planned PsA pts starting guselkumab (GUS) or IL-17i as first- to fourth-line biologic therapy (monotherapy or in combination with other agents) per standard clinical practice [1]. All enrolled pts with available PsAID-12 data at BL and the 6M visit (+/-3M) were analysed according to their treatment group (regardless of later switches). Impact of PsA was assessed with PsAID-12 comprising 12 items (including pain, fatigue, skin problems, etc.) scored 0-10, with higher values indicating a worse state. Mean change from BL in PsAID-12 subdomain and total scores, and proportions of pts achieving minimal clinically important improvement (MCII, ≥1.4) at the 6M visit were determined. Propensity score (PS) analysis evaluated treatment effect for the change in PsAID-12 total score and MCII (using nonresponder imputation), adjusting for BL imbalances across cohorts. Subdomain analyses were descriptive.
Results: At the Jan 2024 cutoff date, 323 and 296 pts receiving GUS or IL-17i, respectively, with PsAID-12 data available at BL and the 6M visit were analysed. In both cohorts, PsAID-12 subdomains with highest impact at BL were pain, fatigue, and discomfort. At the 6M visit, mean (95% confidence interval [CI]) changes from BL in PsAID-12 total score were similar in the GUS (-1.5 [-1.7; -1.3]) and IL-17i (-1.6 [-1.8; -1.3]) cohorts. PS-adjusted treatment effect (regression coefficient [95% CI]) for GUS vs IL-17i in change from BL in PsAID-12 total score was not significant (0.2 [-0.3; 0.6]). Proportions of pts achieving MCII in PsAID-12 total score at the 6M visit were 53% and 48% in the GUS and IL-17i cohorts, respectively , with a non-significant PS-adjusted treatment effect (odds ratio [95% CI]: 1.2 [0.8; 1.8]). Mean changes from BL in subdomain scores were similar across cohorts. [Fig 1]
Conclusion: By 6M of treatment, clinically meaningful improvements in PsAID-12 total score were seen in around half of pts treated with GUS or IL-17i, with similar magnitudes of effect across subdomains in both cohorts. These results may be useful in shared treatment decision-making.

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Predictors of Biologic Drug Survival Time in Patients with Psoriatic Arthritis in a Community-Based Practice

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Objectives: First, to compare the duration of drug survival of biologic drugs used in the treatment of psoriatic arthritis in a community-based practice. Second, to assess the influence of sex, smoking status, HLA-B27 status, and concomitant disease modifying anti-rheumatic drug (DMARD) use on biologic drug survival.
Methods: This single-center, retrospective chart review identified patients diagnosed with psoriatic arthritis who were treated with one or more biologics prior to June 2024. Follow up continued to June 30, 2024 or until treatment was stopped. Drug survival time was recorded, alongside patient sex, smoking status, HLA-B27 status, and concomitant DMARD use. Median biologic drug survival was assessed using the Kruskal-Wallis test, with post-hoc Dunn's multiple comparisons. A Cox multivariate regression model evaluated the effects of age, sex, smoking status, concomitant DMARD use, and HLA-B27 status on biologic survival.
Results: We identified 302 patients diagnosed with psoriatic arthritis who had received one or more biologics. The median age was 61 years, with 48% being female. Overall, drug survival data exhibited a right-skewed distribution. Median (IQR) drug survival times (in months) for adalimumab, golimumab, etanercept, ustekinumab, certolizumab, secukinumab, infliximab, upadacitinib, and ixekizumab were 22 (8–77.5), 28 (8.25–79.75), 35 (10–97), 24.5 (8.75–69.25), 27 (4.5–75), 16 (7–42), 30.5 (11–50.25), 8 (5–14), and 17 (9–35), respectively. In first-line use, the median (IQR) survival time for adalimumab, golimumab, etanercept, and infliximab were 30 (10.5–81), 79.5 (34–110), 67 (25–126), and 38.5 (16–60.75) months, respectively. Etanercept demonstrated significantly longer survival time compared to adalimumab ($p = 0.0162$) and infliximab ($p = 0.0267$). Loss of efficacy was the reason for discontinuation in 70.97% of etanercept cases, 60.27% of adalimumab cases, and 63.64% of infliximab cases. Smoking history and female sex were associated with higher rates of biologic discontinuation, with HRs of 1.268 (95% CI, 1.033–1.556) and 1.281 (95% CI, 1.050–1.566), respectively. Concomitant DMARD use and HLA-B27 positivity did not significantly impact biologic survival, with HRs of 1.004 (95% CI, 0.821–1.230) and 0.738 (95% CI, 0.497–1.066), respectively.
Conclusion: Etanercept demonstrated a longer median drug survival time as a first-line treatment compared to adalimumab and infliximab. Smoking history and female sex were associated with an increased risk of biologic discontinuation. Concomitant DMARD use and HLA-B27 status did not significantly influence biologic survival. These results underscore the importance of individual patient factors in the management of psoriatic arthritis.

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Difficult-To-Treat Psoriatic Arthritis is Uncommon in a Real-World Registry

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Objectives: The increasing availability of advanced therapies for psoriatic arthritis (PsA) offers more opportunities for patients to achieve low disease activity or remission. This real-world analysis examines a cohort of PsA patients in Alberta, Canada, to assess the use of biologic/targeted synthetic disease-modifying antirheumatic drugs (b/tsDMARDs) over two decades and identifies the proportion of patients with b/tsDMARD-refractory disease.
Methods: The RAPPORT (Rheumatoid Arthritis Pharmacovigilance Program and Outcomes Research in Therapeutics) cohort, based in northern Alberta, Canada, includes PsA patients from 2003 to 2024. Participants undergo baseline and follow-up assessments every 3–12 months for

disease activity, patient-reported outcomes (e.g., Health Assessment Questionnaire), and comorbidities, particularly after initiating b/tsDMARDs following failure of conventional synthetic DMARDs. This analysis included 546 PsA patients with at least one year of follow-up. Refractory b/tsDMARD disease was defined as the failure of three or more classes of b/tsDMARDs, following the criteria used for treatment-refractory rheumatoid arthritis [1]. Baseline demographic and disease-related characteristics of refractory and non-refractory patients were compared.
Results: Of the 546 PsA patients, 517 (95%) were non-refractory, while 29 (5%) met the criteria for b/tsDMARD-refractory disease. Sixty percent of the cohort initiated advanced therapies from 2011 onwards, including 72% of refractory patients and 60% of non-refractory patients. The majority were treated with TNF inhibitors, with 85% of non-refractory and 76% of refractory patients using this class of drugs. Apremilast was used by 16 non-refractory and 2 refractory patients, with no other advanced therapies reported. Refractory patients were more likely than non-refractory patients to be female (72% vs. 57%), current smokers (21% vs. 17%), and had a shorter disease duration (6.8 vs. 7.7 years). Time to switch between b/tsDMARDs was shorter in the refractory group (1.37 vs. 5.23 years), with more frequent cycling through b/tsDMARDs compared to non-refractory patients. [Table 1]
Conclusion: Refractory PsA patients cycled through TNF inhibitors more rapidly than non-refractory patients. Further real-world data are needed to assess the impact of patient and disease characteristics on drug survival and to optimize treatment algorithms with the introduction of newer therapies such as JAK and IL-17 and 23 inhibitors.

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Effectiveness of B/tsdmards Including Ixekizumab Per Line of Therapy and Concomitant Csdmards Use in Psoriatic Arthritis: Real-World Data from a Prospective Observational Study

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Objectives: Treatment (tx) guidelines for psoriatic arthritis (PsA) recommend biologic disease-modifying antirheumatic drugs (bDMARDs) or targeted synthetic (ts) DMARDs after inadequate response to conventional synthetic DMARDs (csDMARDs)1. In clinical studies, ixekizumab (IXE) has shown efficacy in patients (pts) with PsA who were bDMARD-naive2, tumour necrosis factor inhibitor (TNFi)-experienced3, and with and without concomitant csDMARDs. Data from real-world studies is limited. This interim analysis reports the effectiveness of IXE and other b/tsDMARDs in b/tsDMARD-naive (naive) and -experienced (exp) pts as well as in monotherapy (mono) and in combination (combo) with any csDMARD at 12 months (M) in real-world setting.

Methods: In the PRO-SPIRIT study, pts with PsA who initiated or switched to new b/tsDMARDs were evaluated in 5 European countries, and Canada. Pts were categorized by prior b/tsDMARD tx and concomitant csDMARD use at baseline (BL), respectively. Descriptive data for the analysis population at 12 M are presented. Mixed models for repeated measures (MMRM) were used to assess change from BL (CFB). Missing data were handled using multiple imputation.
Results: Of 1192* pts, TNF inhibitors (TNFi) (68.6%) and secukinumab (SEC) group (33.5%) had the highest proportion of naive pts, whereas TNFi (53.5%) and JAKi (46.8%) had the highest proportion of combo pts. At 12 M, similar mean CFB was observed in pts treated with IXE for clinical Disease Activity in Psoriatic Arthritis (cDAPSA) in the naive (-13.6), exp (-12.1), mono (-12.3), and combo (-12.4) subgroups (subsequently reported in that order, herein); as well as for body surface area (BSA) (-5.0), (-3.6) (-4.4) and (-3.9). Similar trends were observed in tender joint counts and swollen joint counts. However, mean CFB in cDAPSA was lower in exp versus (vs) naive pts treated with SEC (-8.9 vs -12.8), IL-12/23i (-7.4 vs -16.2) and IL-23i (-10.1 vs -17.2) and lower in mono vs combo in TNFi (-12.5 vs -15.2) and IL-23i (-11.0 vs -12.6). Mean CFB in BSA was lower in exp vs naive pts treated with TNFi (-2.8 vs -5.4), and IL-23i (-2.0 vs -5.3).
Conclusion: In real-world setting, IXE demonstrated similar effectiveness on joints and skin regardless of therapy line and concomitant csDMARDs, confirming findings from IXE clinical trials2,3. Other treatments showed less consistent results either in exp vs naive pts (SEC, IL-12/23i, IL-23i) or in mono vs combo therapy (TNFi, IL-23i).

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Atlantoaxial Subluxation in Patients with Psoriatic Arthritis

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Objectives: We aimed to determine the incidence and prevalence of atlantoaxial subluxation (AAS) in a cohort of psoriatic arthritis (PsA) patients, describe their characteristics, and identify risk factors associated with AAS development.
Methods: We included individuals from our prospective observational cohort of PsA patients, excluding those with a history of trauma or cervical spine surgery. We calculated prevalence and incidence of AAS, and we used descriptive statistics to summarize and compare baseline demographic and disease-related characteristics between patients with and without AAS. Additionally, we performed a univariate Cox regression analysis to assess the factors associated with the development of AAS.
Results: A cohort of 1,535 patients with PsA was assessed, with 34 patients (2.2%) having AAS

at any point during clinical follow-up. Of these, 20 presented with AAS at baseline, while 14 developed AAS during follow-up, resulting in an incidence rate of 0.93%. Among the patients with AAS, 41.2% were male, with a mean age at PsA diagnosis of 31.94 years (SD 13.79). Patients with AAS had a significantly higher mean swollen joint count (SJC) of 4.5 compared to 2 in those without AAS ($p < 0.001$). The prevalence of sacroiliitis according to modified New York Criteria (mNY) was higher in the AAS group, at 71% compared to 22% ($p < 0.001$). Radiographic damage to peripheral joints was significantly greater in patients with AAS, with a median radiographic damaged joint count (rDJC) of 7 compared to 1 in those without AAS ($p < 0.001$). The Steinbrocker score was higher in AAS patients, with a median of 20.5 [IQR 6-39] versus 2 [IQR 0-10] in those without AAS ($p = 0.001$). Abnormal erythrocyte sedimentation rate (ESR) was present in 86.7% AAS patients compared to 42.6% in those without AAS (<0.001). While HLA-B27 positivity was more prevalent among AAS patients (24.2% vs. 16.4%), this did not meet statistical significance. No significant differences were observed between patients with and without AAS regarding other domains in psoriatic arthritis or treatments. In the univariate Cox regression analysis, significant factors associated with time to development of AAS included a higher Psoriasis Area and Severity Index (PASI), abnormal ESR, higher Steinbrocker score, higher rDJC, and the presence of sacroiliitis (Table 1).
Conclusion: Atlanto-axial subluxation in PsA patients is associated with axial involvement, as evidenced by radiographic sacroiliitis and syndesmophytes, peripheral joint damage, and elevated ESR, which collectively indicate a more severe disease.

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Patients with Psoriatic Arthritis from a Phase 4 Head-To-Head Study Stratified by Nail Involvement

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Objectives: Nails are a challenging body area to treat in patients (pts) with psoriatic arthritis (PsA)1. In this analysis, we sought to understand whether baseline (BL) nail involvement is an important indicator of treatment response in pts with PsA from the SPIRIT-H2H (NCT03151551) study.
Methods: This descriptive post hoc analysis included 565 pts with PsA from SPIRIT-H2H treated with either ixekizumab (IXE), an IL-17A inhibitor, or adalimumab (ADA) with Nail Psoriasis Severity Index (NAPSI)>0 or NAPSI=0 at BL. All pts satisfied the CASPAR classification criteria guidelines for PsA2. Parameters assessed included Disease Activity in Psoriatic Arthritis-Low Disease Activity (DAPSA-LDA), Psoriasis Area Severity Index (PASI) 90 and 100, Minimal Disease Activity (MDA; calculated with PASI instead of BSA), swollen (SJC) and tender joint count (TJC), SF-36 Physical (PCS) and Mental (MCS) Component

Summary score, and Dermatology Life Quality Index (DLQI). Non-responder imputation was used to handle missing data.
Results: Of the 565 pts at BL, 368 had nail involvement (NAPSI>0) and 197 had no nail involvement (NAPSI=0). BL characteristics were similar for age and body mass index, with differences based on nail involvement at BL evident for sex, duration of symptoms since PsA onset, SJC and TJC, and PASI score, which were higher in pts with nail involvement. Pts with nail involvement at BL demonstrated higher SJC and TJC improvement vs those without involvement at W12, W24 and W52 following treatment with IXE and ADA compared to patients without nail involvement at BL (Table). IXE achieved rapid response for DAPSA-LDA as early as W12 (59.7%) and maintained this response up to W52 (64.4%). For PASI 90 and MDA, IXE achieved a more rapid and higher response rates compared to ADA in pts with and without nail involvement at BL (Table). In pts with nail involvement, IXE demonstrated improvement in SF-36 MCS and PCS as early as week 12 and maintain up to week 52 compared to ADA (Table).
Conclusion: IXE and ADA both showed numerically greater SJC and TJC reduction in those with nail disease. Further, IXE and ADA both demonstrated joint improvement in pts with and without nail involvement at BL. In the subset of pts with BL nail involvement, numerically higher proportions of pts treated with IXE compared to ADA achieved DAPSA-LDA, PASI 90, MDA, and SF-36 as early as W12, and sustained up to W52.

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Golimumab for Adherence in Rheumatoid Arthritis (Go Far): a Multicentre, Prospective, Observational Study of Patients Treated with Golimumab for Rheumatoid Arthritis

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Objectives: Adherence to prescribed drug therapies is crucial to prevent irreversible joint damage in rheumatoid arthritis (RA). However, reported adherence rates in RA patients have shown significant variability, ranging from 49.5% and 98.5%, depending on the definition and method used. Despite this, real word evidence on adherence to golimumab, a biologic DMARD used in RA, remains limited. This study aimed to investigate whether non-adherence to RA drugs in patients treated with biologic DMARDs is associated with a higher frequency of RA flares in real-world clinical practice.
Methods: This was a prospective, non-interventional study conducted in 27 Canadian centres, which assessed real-world golimumab use in treating RA. The study collected data from medical records and patient/physician questionnaires. The study utilized the Rheumatoid Arthritis Flare

Questionnaire (RA-FQ), a tool designed to assess disease activity and identify flares in patients with RA. Patients were categorised into low (≤80%) and high (>80%) predicted compliance groups using the Compliance Questionnaire in Rheumatology (CQR). Assessments occurred at baseline and 6-month intervals, covering joint counts, global assessments, adherence, and flares. Statistical analysis aimed to estimate flare rate differences between adherent (>80%) and non-adherent groups (≤80%), considering a 95% confidence interval.
Results: A total of 215 patients were treated and analysed in the study, with 78.6% (169/215) completing the study. At 6 months, the mean RA-FQ was 22.5 (SD 13.1) and 23.8 (SD 13.2) in low and high baseline predicted compliance groups, respectively (p=0.55). At 12 months, the mean RA-FQ scores were 20.9 (SD 12.9) and 19.9 (SD 13.5) for the low and high baseline predicted compliance groups, respectively (p=0.70). Disease flares were observed in 35.7% (25/70) and 28.2% (20/71) of patients at 6 months in the low and high baseline predicted compliance groups, respectively (p=0.34). At 12 months, disease flares were observed in 30% (21/7) and 24.7% (18/71) of patients in the low and high baseline predicted compliance groups, respectively (p=0.49). No significant differences were observed in the incidence of adverse events between the low and high adherence compliance groups.
Conclusion: This study did not identify major differences in the RA-FQ total score or the proportion of participants reporting a flare in RA patients in the real-world clinical setting. Sensitivity analyses will be conducted to further explore RA-FQ and disease flare frequency by varying the CQR compliance classification.

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Injection Site Pain and Adherence in Patients Switching from Reference Adalimumab to Avt02 – Ease Pain Trial.

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Objectives: Background: AVT02, a biosimilar to reference product (RP) adalimumab, was first approved in Canada in 2022. AVT02 is formulated at high concentration and with citrate-free excipients. The EASE PAIN trial is a Phase IV study in Canada evaluating the impact of switching from RP, or an alternative adalimumab biosimilar, to AVT02. The primary objective was to examine the impact of switch on injection site pain across patients in Canada. Secondary objectives included describing the impact of switching on injection site reaction including burning sensation and soreness, treatment Adherence, and patient-reported quality of life.
Methods: Methods: The study enrolled patients with gastrointestinal conditions (Crohn's disease [CD], ulcerative colitis [UC]), rheumatological conditions (rheumatoid arthritis [RA], ankylosing spondylitis [AS], psoriatic arthritis [PsA]), or dermatological conditions (hidradenitis suppurativa [HS], psoriasis [PsO]). Participants were eligible if their treating physician had decided to switch them from low-concentration RP or alternative adalimumab biosimilar to AVT02. The study assesses injection site pain measured via Visual Analog Scale (VAS), adherence, and quality of life (based on EQ-5D-5L) for participants up to Day 180 after switching. The study is currently ongoing.
Results: Results: The intention-to-treat (ITT) population comprised 287 participants. Following

the first administration of AVT02, injection site VAS pain score decreased by an average of -18.8 ± 25.51 across the whole population. Supporting this, there was reduction in overall injection site reactions (49.1%), burning sensation (79.4%), and soreness (84.8%) between baseline (RP administration) and follow-up (AVT02 administration). Adherence rate was 95.5% overall. The ITT population maintained high quality of life score (EQ-5D-5L score of >81 on a scale of 1-100) after switching from RP to AVT02.
Conclusion: Conclusion: The results of this study demonstrate that switching from RP or alternative biosimilar adalimumab to AVT02 leads to decreased injection site pain across all indications, and maintenance of high adherence rates and high quality of life among patients.

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Raynaud's Phenomenon: A Rare Presentation with Gangrene

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The report highlights the case of a 46-year-old female with a complex medical history, including ankylosing spondylitis, and psoriatic arthritis, who presented with gangrenous changes in the second toe in each foot with the right side more severely affected than the left. The patient initially reported symptoms suggestive of chilblains, for which she was treated which progressed to severe digital ischemia and necrosis, ultimately leading to the amputation of both toes. She did not have any RP symptoms in her other toes or in her hands. When her initial symptoms did not respond to treatment she was diagnosed and treated for vasculitis. Despite comprehensive diagnostic investigations, including imaging, autoantibody profiling and other laboratory studies, the diagnosis of vasculitis was never proven. She did not respond to any of the treatments for vasculitis. Ultimately her diagnosis was that of severe RP with gangrene of the affected toes. This case presentation highlights the importance of early recognition and multidisciplinary management of RP, especially in patients with other overlapping autoimmune conditions.

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Mpo-Anca Positivity in a Patient with Pyoderma Gangrenosum and Graves' Disease: a Case Report and Review of the Literature

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A 73-year-old woman with a history of Graves' disease treated five years prior with propylthiouracil and methimazole presented with ulcerative lesions of the flank and perineal area. Rheumatology assessment was triggered on account of her having a positive anti-MPO ANCA antibody. Further workup including testing for antiphospholipid antibodies, hepatitis B and C, HIV, and syphilis, was all negative. On review she had no clinical evidence of inflammatory bowel disease or another systemic rheumatologic condition, specifically, no evidence of ANCA vasculitis. Biopsy of the skin lesions was compatible with pyoderma gangrenosum. She was started on prednisone 50 mg daily for 2 weeks followed by a taper. At most recent assessment 6 months later she had completed the prednisone and was using Protopic only, with almost complete healing of her skin lesions. Thyroid biochemistry revealed

hyperthyroidism, suggesting recurrence of Graves' disease as a possible trigger for the pyoderma gangrenosum. Although the association between antithyroid medications and development of AAV is widely known, the lengthy interval since this patient received these treatments made their implication less likely.

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Clinical Associations and Outcomes of Pericarditis in Systemic Lupus Erythematosus

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Objectives: We aimed to study the prevalence, outcomes, and associations of pericarditis in lupus.

Methods: This is a retrospective analysis of patients with pericarditis identified from a single-center SLE prospective database from July 1970 to Mar 2024. The diagnosis of pericarditis was based on SLEDAI-2K. The prevalence of pericarditis was determined in both inception (enrolled within one year of diagnosis) and prevalent cohorts. The remaining analysis focused on the inception cohort. Demographic and clinical variables were retrieved. The outcomes of pericarditis were defined as acute (resolution < 3 months), chronic (lasting ≥ 3 months), and relapsing (recurrence after complete resolution). Variables associated with pericarditis were analyzed using Cox proportional hazards modeling. Factors associated with the outcome of pericarditis (acute vs. chronic, relapse vs. no relapse) were examined within the pericarditis subgroup.

Results: Pericarditis was identified in 428 of 2122 patients(20.16%), 205 of 900(22.8%) in the inception, and 223 of 1222(18.2%) in the prevalent cohorts. The median age at SLE diagnosis was 30.31 years(IQR 13.72-41.06) (Table 1). Pericarditis typically developed early in the disease course, with a median disease duration of 0.51 years(IQR 0.11-2.11) at the first event. In 170 patients, the severity of chest pain was 6.5 of 10 (IQR 4.25-8). Associated myocarditis was observed in 5.3%, endocarditis in 1.9%, and cardiac tamponade in 1.4%. SLEDAI-2K at the time of pericarditis was 6(2-14) with commonly affected organ systems being hematologic(81%) and skin(76.1%). The majority had low complements and/or elevated anti-dsDNA(79.5%). Treatment included oral glucocorticoids (79%), and antimalarials (54.6%), with the most common immunosuppressant being azathioprine(20.9%). In comparison with patients without pericarditis, pericarditis was associated with younger age[0.98 (0.97-0.99)], higher average mean SLEDAI-2K[1.05 (1.02-1.09)], more constitutional symptoms[1.6 (1.19-2.19)], and less skin involvement[0.41 (0.27-0.62)]. The pericarditis outcomes were favorable for most, with 79.5% achieving complete resolution within 3 months. Chronic pericarditis was observed in 15.6% and lasted for 4.59 (3.3-16.78 months). Relapses occurred in 22.9% of patients, with a median of two relapses (IQR 2-3). No associations with disease duration at the time of the first event, anti-Sm, anti-dsDNA, use of glucocorticoids, or immunosuppressants were found for those with chronic pericarditis and relapses.

Conclusion: Pericarditis was observed in one in five patients and was typically seen early in the

disease course. The majority resolved within 3 months, with chronic pericarditis in 15.6%, and relapsing course in 22.9%. No associations were observed with chronic pericarditis and relapses.

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Characterizing Arthritis Subtypes in SLE: Prevalence, Clinical Features, and the Role of Type I Interferon Signatures

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Objectives: To study the prevalence of SLE arthritis subtypes, deforming and non-deforming arthritis, and determine the association with clinical features, serology, and the influence of type I interferon.

Methods: This is a retrospective study of patients with arthritis defined by the ACR or EULAR/ACR SLE classification criteria at presentation and SLEDAI 2K over follow-up identified from a single-center SLE database(July 1970-Aug 2024) from both inception and prevalent cohorts. Demographic, clinical, laboratory(including interferon signature), radiographic features, and treatment variables were retrieved from the database. Descriptive statistics were used to outline features across three subtypes of arthritis; non-deforming arthritis (determined by clinical examination), arthritis with reducible deformities or Jaccoud's Arthropathy (JA), and arthritis with non-reducible deformities or rhupus. Factors associated with deforming arthritis were determined using multivariate Fine and Gray modeling for the inception cohort.

Results: Arthritis was observed in 1,248 of 2264(55.12%) patients. 908(72.6%) had non-deforming and 340(27.2%) had deforming arthritis– 239(19.2%) had JA, 101(8.1%) had rhupus. The median age at diagnosis of SLE was comparable, though a higher proportion of females was observed in JA($p=0.03$). The distribution of organ involvement and antibodies was similar across the three subtypes, except nervous system involvement($p=0.03$) and anti-Ro antibodies($p=0.04$) being more frequent in rhupus. There was a trend toward higher mean SLEDAI-2K scores in JA($p=0.07$), and the SDI was highest in rhupus($p<0.01$). The distribution of rheumatoid factor and anti-CCP positivity did not differ significantly. The proportion of patients with high interferon signature was the greatest in JA, followed by non-deforming arthritis, and lastly, rhupus($p<0.01$). Radiographs (n, 95) revealed erosive disease in 10 of 43(23.2%) with JA, 12 of 36(33.3%) with rhupus, and 2 of 16 (12.5%) with non-deforming arthritis. The use of glucocorticoids, mycophenolate, and belimumab was most prevalent in JA, while methotrexate was higher in rhupus. (Table 1) In the multivariate analysis, JA was associated with higher average mean SLEDAI 2K[1.09(1.01-1.19)] and females[3.3(1.14-12.5)]. No associations were observed with rhupus.

Conclusion: Arthritis was observed in half the cohort, with the majority being non-deforming (72.6%). Among deforming arthritis, JA (19%) was more common than rhupus (8%). JA was associated with a high interferon signature, high disease activity, and female sex compared to

rhupus. This sheds light on two different mechanisms for deforming arthritis with JA associated with SLE disease burden in contrast to rhupus. Erosions were observed in both types of deforming arthritis blurring the line of radiologic differences historically outlined between them.

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Baseline Serum Osteopontin (OPN) Level is Associated with Early Coronary Artery-Calcification and its Progression in Patients with Systemic Lupus Erythematosus

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Objectives: To determine the incidence and progression of Coronary-Artery calcification (CAC) To determine whether OPN serum levels are associated with progression of CAC in SLE patients

Methods: Inception Cohort. Since enrollment into the cohort, all patients had a standardized medical history, physical examination, and laboratory tests, including lipid profile, apoB, homocystein, high-sensitivity C-reactive protein (hs-CRP), serum complement (C3 and C4), and autoantibodies. Every 3-6 months, patients were seen at the lupus clinic for medical care, and assessments of disease activity using the SLE disease activity scores, and medications usage. Every year, information was updated, including lupus characteristics, damage accrual, any co-morbidities, traditional cardiovascular risk-factors, and a blood sample has been drawn. In 2008, 104 lupus patients from the cohort (93% females) were screened for coronary-artery calcifications using Multidetector Computed Tomography, after first 5 years of follow-up. In 2018 a follow-up screening for CAC was carried-up. Progression of CAC was considered as positive if i) patients without CAC in 2008 were found with CAC+ in the second screening or ii) patients with CAC positive in 2008 were found with any increase of their Calcium Score. OPN plasma levels were measured by ELISA. Correlates for calcifications were analyzed. Cumulative incidence of CAC was calculated and risk factors for CAC progression were identified by multivariate analysis.

Results: At-enrollment, lupus patients were 27.2+9.1 years of age and disease duration 5.4+3.8 months.. On 2008 during the first CT screening, CAC were detected in 7. 2% patients, since age 23 years, and from three years of disease duration. At follow-up screening, progression of CAC was identified in 16.3% (IC95% 10. 4-24. 6). Cumulative incidence of CAC was observed in 9%. Mean value of OPN level at baseline was 102.7 ng/mL (95% CI = 89.3-116.1 ng/mL). Earlier Risk factors associated with CAC were disease activity (p=0. 03) and disease duration (p=0. 03) while risk factors for progression of CAC were postmenopausal status (p=0. 01), apoB levels (p=0. 01) and OPN levels (p=0.009). There was a positive correlation for progression of CAC and adjusted mean SLEDAI at first 5 years of follow-up and baseline OPN levels (p=0.006).

Conclusion: Our findings suggest that in patients with SLE, early CAC is associated with disease severity while in the progression of CAC, traditional risk factors for atherosclerosis and OPN level were adding

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A Case of Familial Cold Autoinflammatory Syndrome Type 2

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Mrs X, a 46yo F, was referred for further evaluation and treatment of a possible cold autoinflammatory syndrome. She has a history of cold induced episodes starting in her late childhood, which have worsened in severity since a SARS-CoV-2 infection in 2022.

Her cold induced episodes are marked by widespread hives and flushing, with associated arthralgias and myalgias, chest pain with concurrent tachycardia, and abdominal cramping with diarrhea. These episodes are self-limiting over the course a day. She additionally has ongoing cyclic fevers, fatigue and headaches. Her physical examinations have always been unremarkable apart from these cold induced episodes where she has widespread flushing of her skin and hives. Prior to this referral she has been evaluated by a number of other subspecialists who's investigations only were revealing of elevated serum amyloid A levels.

She had genetic testing done looking for monogenic periodic fever syndromes, which revealed mutations of unknown significance in her NLRP12 gene, an area also mutated in her fathers testing. She has an extensive history of similar cold induced episodes in other family members, which vary in severity, and follow an autosomal dominant pattern through her fathers family. No one in her family has received a formal diagnosis at this time. With this information, medical genetics agreed that this likely represents a cold autoinflammatory syndrome, familial cold autoinflammatory type 2, which is likely related to her NLRP12 mutation.

Mrs X has been using intermittent prednisone to treat these episodes with good effect previously. She was initiated on Anakinra, an IL-1 receptor antagonist, which was effective at reducing the frequency and duration of her episodes, where she no longer uses prednisone.