



**THE ARTHRITIS RESEARCH CANADA/  
ARTHRITE-RECHERCHE CANADA**  
THURSDAY, DECEMBER 12, 2019  
**QUARTERLY REPORT OF THE SCIENTIFIC DIRECTOR**

### **BREAKING NEWS**

The Arthritis Alliance of Canada holds a national competition for five awards regarding various level of trainee and new investigators. Arthritis Research Canada received three of the five (see below).

The National Meetings of the American College of Rheumatology have just been held with 15,000 attendees. 2989 scientific papers were presented, Arthritis Research Canada/Arthrite-recherche Canada trainees, scientists and patients presented 86 or 2.9% of the papers. This is simply a staggering accomplishment. See papers below.

### **TRAINEES**

Arthritis Research Canada Richmond welcomed two new trainees in September. **Nejat Hassen** (Supervisors: **Diane Lacaille** and **Jacek Kopec**) is completing her Master's and will investigate '*Geographic disparities in burden of disease from rheumatoid arthritis*', and **Olubayo Kolawole** (Supervisor: **Antonio Avina**) is a PhD student whose project will be on '*Hydroxychloroquine toxicity in rheumatoid arthritis and systemic lupus erythematosus*'.

**Laurence Mainville** (Supervisor: **Paul Fortin**) joined Arthritis Research Canada/Arthrite-recherche Canada Laval in September. His thesis project is '*Retrospective cohort study comparing disease severity in psoriasis treated with biotherapy under a public or private drug insurance plan*'.

### **Trainee Salary Awards and Scientific Awards**

Arthritis Research Canada Calgary Trainee **Darren Mazzei** (Supervisor: **Deborah Marshall**) was awarded a three-year Arthritis Society doctoral salary award of \$63,000. His project is '*Informing public funding decisions for an exercise and education program for osteoarthritis*'.

Arthritis Research Canada Calgary Trainee **Christina Le** (Supervisor: **Jackie Whittaker**) was awarded a three-year Arthritis Society doctoral salary award of \$63,000. Her project is '*Health-related quality of life following a youth sport-related knee injury: Implications for preventing post-traumatic osteoarthritis and promoting lifelong well-being*'.

**Kelsey Chomistek** (Supervisors: **Cheryl Barnabe** & Heinrike Schmeling) was awarded the Arthritis Alliance of Canada Master's Student Research Award.

Three Arthritis Research Canada Trainees were awarded competitive Arthritis Research Canada/Lilly Early Rheumatology Researcher Travel Scholarships to attend the 2019 National Meetings of the American College of Rheumatology in Atlanta. **May Choi** (Supervisors: **Deborah Marshall** & Marv Fritzler) was first author on one abstract and co-author on 2 others. (#12, 46 & 82 below); **Gloria Li** (Supervisor: **Antonio Avina**) presented four papers as first author. (#39 - #42 below); and **Teresa Szlachetka** (Supervisor: **Diane Lacaille**) presented a paper for the first time at this meeting. (#65 below).

## **FACULTY**

On September 19, 2019 **Linda Li** was inducted as a Fellow of the Canadian Academy of Health Sciences in recognition of her significant contribution to health sciences. The Academy requires that one has consistently demonstrated the highest level of leadership, creativity, research skill and research productivity. Dr. Li has been a leader in advancing the engagement of the public in research from the idea stage to the promotion of the final results, as well as a leader in studying digital methods for disseminating results and a superstar in knowledge translation.

At the September 2019 Board of Directors meeting **Ines Colmegna** was unanimously voted to become a new Arthritis Research Canada/Arthrite-recherche Canada scientist. Dr. Colmegna's research focuses on defining basic mechanisms accounting for the disruption of immune tolerance in patients with rheumatoid arthritis.

## **Salary Awards and Scientific Awards**

**Laëtitia Michou** has been awarded a one year Arthritis Centre grant of \$14,995 from The Arthritis Society. The grant will provide support for a multicentre clinical research project involving a medical student and internal medicine and rheumatology residents.

**Linda Li** is a Co-Investigator on two implementation team grants from the Michael Smith Foundation for Health Research. Both grants are for \$500,000 each over three years. Co-Primary Investigators on the first one include Teresa Liu Ambrose, Megan Oakley, Fabio Feldman, Jennifer Davis and Co-Investigators **Hui Xie**, **Jasmin Ma**, **Cheryl Koehn**, Chris Shaw and Deborah Jehu. The title is '*Implementing an evidence-based exercise program to reduce falls in community-dwelling older adults*'.

Primary Investigators on the second award are Sonia Singh, Larry Funnel, and Tania Bubela. **Linda Li** leads the implementation component. The title is '*Breaking the cycle of recurrent fracture: Scaling up a secondary fracture prevention program in Fraser Health to inform spread across BC.*'

**Jackie Whittaker** was awarded the Arthritis Alliance of Canada Early Career Researcher in Basic and Clinical Sciences and **Glen Hazlewood** was awarded the Early Career Researcher in Health Science/Population Health.

## **ARTHRITIS PATIENT ADVISORY BOARD**

APAB has welcomed five new members: **Mona Marzban, Chris Pudlak, Nikki Bhatti, Samantha Rogers** and **Haini Truong Hai**. At 22 members the Board is full.

APAB completed an 'APAB 101' orientation session for the new members. Arthritis Research Canada Trainee **Jasmin Ma** (Supervisor: **Linda Li**) presented her experience of the researcher's perspective on working with patients.

APAB completed a one year review of its three year strategic plan. Key goals accomplished include:

- The Member Handbook was updated and the committee and accountability structure improved.
- Membership diversity increased.
- All new members oriented via updated APAB 101.
- Reaching Out with Arthritis Research transitioned to "Arthritis Research Education Series".

**Kelly English spoke** at the UBC Centre for Applied Ethics 25<sup>th</sup> Anniversary celebration on "Changing the research ethics paradigm".

**Arthritis Research Canada arranged for Kelly English** and **Eileen Davidson** to attend the American College of Rheumatology meetings in Atlanta. In all, five Patient Advisory Board Members were co-authors on three abstracts presented at the meeting.

## **PATIENTS IMPLIQUES DANS LA RECHERCHE SUR L'ARTHRITIE (PIRA)**

**Marie-Claude Beaulieu**, PIRA member, presented a poster at the Annual Meeting of the American College of Rheumatology as part of the Patient Perspectives Poster Program. See #10 below.

In November, the research center of CHU de Québec-Université Laval had the honor and pleasure of receiving **Diane Lacaille**. Dr. Lacaille gave two presentations: 1) '*Premature mortality in RA, have we made any headway*' and 2) '*Using administrative health data for arthritis research, lessons learned from the BC experience*'.

## **American Society for Bone and Mineral Research Annual Meeting, September 20-23, 2019, Orlando FL**

1. Dessay M, Couture E, Gagnon E, Brown JP, **Michou L**. Impact on the clinical and osteoclastic phenotypes of a rare variant in the DOCK6 gene in familial forms of Paget's disease linked to the p. Pro392Leu mutation in the SQSTM1 gene.

*Paget's disease of bone is a chronic bone disorder, mostly affecting the elderly. This disease has a genetic component in one third of cases. We compared cases where a genetic mutation (SQSTM1) was present to cases with the genetic mutation and another genetic variant (DOCK6) and found that the disease appears to be less extensive and the age at diagnosis was older than when the mutation was present alone, suggesting that the variant may attenuate the activity of the disease caused by the SQSTM1 mutation.*

2. Farlay D, Rizzo S, Ste-Marie LG, **Michou L**, Morin S, Qiu S, Rao SD, Brown JP, Boivin G. Altered Bone Quality in Long-Term Bisphosphonate Users with Atypical Femur Fracture (AFF).

*In this France/Canada collaboration we performed measures of the bone quality in bone biopsies of women with osteoporosis treated by bisphosphonates who experienced or did not experience atypical femur fracture. This pilot project allowed us to show that some measures of the bone quality were different in patients who experienced atypical femur fracture which may be related to be the fact that they received a bisphosphonate treatment for a longer period of time.*

## **61ème réunion du club de recherches cliniques du Québec, Estérel, Québec, 4 octobre 2019**

1. Dessay M, Singbo N, Gagnon E, Brown JP, **Michou L**. Effet modulateur de miR-16 sur l'expression du gène SQSTM1 dans la maladie de Paget. (TRANSL. Modulator effect of miR-16 on SQSTM1 gene expression in Paget's disease.)

*We investigated the expression of certain genes (miR-16 and SQSTM1 gene) in the blood samples of some patients and healthy donors from our French-Canadian cohort. We confirmed that miR-16 indeed decreased the SQSTM1 gene expression in the peripheral blood, therefore possibly contributing to a less severe activity of Paget's disease.*

## **American College of Rheumatology Annual Meeting, November 8-13, 2019, Atlanta, Georgia**

1. Anderson KM, Schieir O, Valois MF, **Bartlett SJ**, Bessette L, Boire G, **Hazlewood G**, Hitchon C, Keystone E, Pope J, Tin D, Thorne C, Bykerk V and Canadian Early Arthritis Cohort (CATCVH) Investigators. Duration of oral corticosteroid therapy does not change with the addition of a parenteral injection: results from a real-world Canadian early RA cohort

*We compared patients who received steroid (prednisone) pills only with those that received pills and intravenous steroids to see if there was a difference in how long patients needed steroids. Combination therapy did not reduce the duration of treatment compared with those receiving pills alone nor did it reduce disease activity more than oral steroids.*

2. Anderson N, Schieir O, Valois MF, Boire G, Pope J, **Hazlewood G**, Bessette L, Hitchon C, Tin D, Thorne C, Keystone E, Bykerk V, **Bartlett SJ**, and Canadian Early Arthritis Cohort (CATCH) Investigators. Major stressors in the year prior to diagnosis affects RA characteristics at presentation and 1 year.

*We examined the impact of stress on how active RA was from the doctor's and the patient's perspective in newly diagnosed RA patients at baseline and after 12 months. We found that patients with **high stress** prior to diagnosis had worse depression, fatigue, sleep disturbance, disability scores and pain after one year even though disease activity was similar between groups who reported less stress before diagnosis.*

3. Aringer M, Brinks R, Costenbader K, Daikh D, Boumpas D, Jayne D, Kamen D, Mosca M, Ramsey-Goldman R, Smolen J, Wofsy D, Diamond B, Jacobsen S, McCune WJ, Clarke AE et al. Performance of the EULAR/ACR 2019 classification criteria for systemic lupus erythematosus in men, diverse ethnicities, and early disease.

*We demonstrated that the EULAR/ACR 2019 SLE classification criteria had a high accuracy of confirming patients who did and did not have SLE and performed well in diverse race/ethnicity groups. These results now need to be independently validated in larger groups of African American, Asian, and Hispanic patients, male patients and in early disease.*

4. **Atiquzzaman M**, Darim M, **Kopec J**, Wong H, **De Vera M**, **Anis A**. Using external data to estimate omitted variables in observational data: a plasmode simulation study investigating the relationship between osteoarthritis and cardiovascular diseases to compare alternative approaches in imputing the body mass index variable.

*In statistics, missing data are calamitous for research accuracy. Proportion-based imputation and multiple imputation are two different methods of replacing missing data in a study. We used an investigation into the relationship between osteoarthritis and heart disease to compare these two methods and found that the results were more accurate when missing variables were imputed using multiple imputation.*

5. **Barber C**, Mosher D, **Hazlewood G**, MacMullan P, **Barnabe C**, **Bohm V**, Rankin J, Homik J, **English K**, **Tsui K**, Pan B, Stevenson M, Sandhu N, Emrick A, Martin L, Durand C, Jung M, **Lacaille D**. Testing rheumatoid arthritis performance measures to optimize treat to target strategies.

*Treat-to-target is an important goal when treating patients with rheumatoid arthritis. In this study based in Calgary, AB, we looked at three aspects of treat-to-target and found important opportunities for improvements in care.*

6. **Barber C**, Shiff N, **Barnabe C**, **Benseler S**, Chin R, Johnson N, Luca N, Miettunen P, Twilt M, Veeramreddy D, Schmeling H. Are we meeting benchmarks for wait times for pediatric rheumatology care for juvenile idiopathic arthritis (JIA)?

*This study showed that within Canada about two-thirds of patients see a children's rheumatologist within the target wait-time (7 days from referral to pediatric rheumatology care). While the type of arthritis was not a factor, older patients were found to have longer wait times.*

7. Baril-Dionne A, Landon-Cardinal O, Meyer A, Bourre-Tessier J, Troyanov Y, Mansour AM, Zarka F, Makhzoum JP, Nehme J, Rich E, Goulet JR, Grodzicky T, Richard I, **Hudson M**, Leclair V, Targoff I, Satoh M, Fritzler M, Senecal JL. Single-specificity anti-SMN autoantibodies are associated with a novel scleromyositis overlap syndrome.

*We studied 21 patients with scleroderma and myositis (scleromyositis) without known autoantibodies. We found 5 patients with autoantibodies to the survival of motor neuron complex (SMN). These 5 patients presented with muscle weakness, Raynaud phenomenon and absent or limited disease-related skin involvement. Patients with anti-SMN antibodies represent is a new subset of scleromyositis.*

8. **Bartlett SJ**, Schieir O, Valois MF, Pope J, Bessette L, Hitchon C, Thorne C, Tin D, **Hazlewood G**, Boire G, Keystone E, Bykerk V and Canadian Early Arthritis Cohort (CATCH) Investigators. Obesity is a robust predictor of persistent high fatigue at 1 year in women and men with early rheumatoid arthritis.

*Persistently high levels of fatigue are present in many early rheumatoid arthritis (ERA) patients. Obesity is common in ERA and an important contributor to persistent high fatigue in both women and men. In guidelines for RA treatment, interventions targeting weight loss may play an important role and strategies to improve mood and manage stress. They may also help reduce persistent high fatigue that does not always improve with RA treatment.*

9. **Bartlett SJ**, Schieir O, Valois MF, Hitchon C, Bessette L, **Hazlewood G**, Thorne C, Pope J, Boire G, Tin D, Keystone E, Bykerk V and Canadian Early Arthritis Cohort (CATCH) Investigators. When will I get past this exhaustion? Predictors of improved fatigue in the first year of RA.

*We examined characteristics and identified predictors associated with improved vs. persistent fatigue in the first year of rheumatoid arthritis among people with high fatigue at diagnosis. In patients who presented with high fatigue, 70% improved by the end of the first year. Obesity decreased the odds of improved fatigue at 12 months by 40%.*

10. **Beaulieu MC**, Robindaine J, Tremblay H, Demers Dubuc S, Liang P, **Gervais F**. Living and adjusting to a diagnosis of rheumatoid arthritis with an Interdisciplinary Team. Presented in the “**Patient Perspectives**” section.

*The initial frequent visits and check- ups, feeling discouraged by my limitations and the need for frequent medication adjustments made me realize the importance of working as a team where the patient is a partner in care. Information about the disease and its treatments is important for the patient.*

11. Becker Y, Julien A-S, **Godbout A**, Boilard E, **Fortin PR**. Antibodies targeting mitochondrial antigens are associated with reduced thrombotic events In APS.

*Our laboratory already reported the presence of anti-mitochondrial antibodies (AMA) in patients with systemic lupus erythematosus. We detected AMA in persons with antiphospholipid syndrome (APS). High titers were associated with lung clots, heart attacks and strokes. Our findings suggest that AMA display different clinical associations in the disease.*

12. Bernatsky S, Ramsey-Goldman R, Urowitz M, Hanly J, Gordon C, Petri M, Ginzler EM, Wallace DJ, Bae SC, Romero-Diaz J, Dooley MA, Peschken C, Isenberg DA, Rahman A, Manzi S, Jacobsen S, Lim SS, van Vollenhoven RF, Nived O, Kamen D, Aranow C, **Fortin P**, **Clarke AE** et al. Cancer risk in a large inception SLE cohort: effects of age, smoking and medications.

*We studied cancer risk in the largest-ever cohort of clinically confirmed SLE patients. There were 60 cancers that occurred, almost half of which were associated with baseline smoking. Only one-third of those patients who did not develop cancer. This is the first large, multicentre cohort study to clearly show how different cancer types in SLE are associated with specific risk factors.*

13. Brunet S, Salat P, **Hazlewood G**, Engelke K, **Barnabe C**, Manske S. The relationship between subclinical inflammation and bone damage in patients with rheumatoid arthritis using multimodality imaging.

*We used a scan called high resolution peripheral quantitative computed tomography (HR-pQCT) to look at bone loss in rheumatoid arthritis patients in clinical remission and tried to measure changes over a 6-month follow-up period. We did not detect increases in bone loss over the course of 6 months in patients with low grade inflammation. Also the absence of localized low grade inflammation was suggested to predict healing of bone loss.*

14. Bykerk VP, Schieir O, Valois MF, Boire G, **Hazlewood G**, Bessette L, Hitchon C, Tin D, Thorne C, Keystone E, Pope J, **Bartlett SJ** and Canadian Early Arthritis Cohort (CATCH) Investigators. Persistent and non-articular regional and widespread pain are common in early rheumatoid arthritis, impacting remission rates and reflected in patient global scores.

*Our goal was to understand pain patterns (localized vs. widespread) and its impact on achieving remission in real-world early inflammatory arthritis patients. We found that widespread soft tissue pain can make measuring remission status difficult.*

15. **Chan J**, Stamp L, Liebergreen N, Ndukwe H, **Marra C**, Treharne G. Rheumatoid arthritis patients' perspectives on tapering of biologics: a qualitative study.

*We sought to identify factors that influence rheumatoid arthritis patients' decision to reduce the dose of their biologic. We found that concerns of uncontrolled disease and receiving access to treatment when disease flares are among the key issues that need to be addressed when planning procedures for dose reduction.*

16. **Choi M**, **Barber M**, Fritzler M, Hanly JG, Urowitz M, St-Pierre Y, Romero-Diaz J, Gordon C, Bae SC, Bernatsky S, Wallace DJ, Isenberg DA, Rahman A, Ginzler EM, Petri M, Bruce I, **Fortin P**, Gladman D, **Clark AE** et al. Is ANA-status at disease inception associated with long-term damage accrual and direct and indirect health care costs in the Systemic Lupus International Collaborating Clinics (SLICC) inception cohort?

*The antinuclear antibody (ANA) test is an important blood test for the diagnosis of lupus. This study looked at whether a positive ANA blood test can also predict whether a patient will have worse disease and incur more health care costs.*

17. **Da Costa D, Szlachetka T, Lacaille D.** Sleep quality in women with rheumatoid arthritis is associated with disease activity and depressive symptoms.
- We found 70% of our sample of women with rheumatoid arthritis (RA) reported poor sleep and that in addition to disease activity, depressed mood was related to poorer sleep in RA. While the use of sleep medication is common in RA, interventions which include nonpharmacological methods to target sleep require evaluation to optimize the management of sleep disruptions in RA.*
18. **D'Aoust J, Leclair V, Gyger G, Meyer A, Fritzler M, Landon-Cardinal O, O'Ferrall E, Karamchandani J, Ellezam B, Massie R, Sato M, Troyanov Y, Hudson M.** Autoantibody profiles delineate three distinct subsets of scleromyositis.
- We studied 36 patients with scleroderma and myositis (scleromyositis). We identified 3 different subsets with distinct patterns of muscle weakness and autoantibodies. This is useful for purposes of prognosis.*
19. **D'Silva K, Bolster M, Castelina F, Sharma A, Little B, Montesi S, Choi HK.** Rituximab therapy for interstitial pneumonia with autoimmune features (IPAF): a case series of nineteen patients.
- We evaluated 19 patients with interstitial pneumonia with autoimmune features (IPAF) (a disorder characterized by lung inflammation or scarring) who were treated with rituximab, an IV infused rheumatic medication. Most IPAF patients treated with rituximab appear to have had improvement or disease stabilization.*
20. **Feehan L, Li L, Lu N, Xie H.** 24-hour activity profiling in people living with arthritis: habits matter.
- We analyzed activity levels in 172 people living with different types of arthritis and identified four different 24-hour profiles based on the time someone was likely to spend sleeping, sitting or walking throughout their day. We found that age and strength of sitting or walking habits predicted which profile they belonged in. These findings suggest that it may be appropriate to tailor strategies to support changes in daily activity based on a person's 24-hour activity profile; particularly in individuals who are older and have strong sitting or weak walking habits.*
21. **Fleischer C, Feser M, Bernis E, Striebich C, Moss LK, Kormendi V, White S, Holers M, Harrison M, Deane K.** Preferences and insights for rheumatoid arthritis clinical prevention trial participation.
- Individuals with antibodies in their blood indicating a risk of developing rheumatoid arthritis were given the option to participate in a prevention clinical trial. After each individual agreed to or refused participation, we surveyed them in order to understand more about the underlying issues that influence participation.*
22. **Gkrouzman E, Sevim E, Finik J, Andrade D, Pengo V, Sciascia S, Tektonidou M, Ugarte A, Chighizola C, Belmont HM, Pérez Sanchez L, Ji Lanlan, Fortin P.** Antiphospholipid antibody profile stability over time: prospective results from AntiPhospholipid Syndrome Alliance for Clinical Trials and InternatiOnal Networking (APS ACTION) Clinical Database and Repository ("Registry").
- Antiphospholipid antibodies (aPL) are autoantibodies that increase the risk of blood clots. We observed patients from the APS ACTION Registry to determine whether aPL present in blood at the beginning of the study remained stable over time. We saw patients every year. We observed that 80% of patients with a baseline clinically significant aPL profile did not change during five years of follow-up.*



23. **Hahn T, Sayre E, Goycochea-Robles MV, Lacaille D.** Adherence to statin therapy in rheumatoid arthritis patients: a population-based cohort study.

*Cardiovascular diseases, such as heart attacks, are the number one cause of premature death in patients with rheumatoid arthritis (RA). We evaluated all RA patients in BC who were prescribed a cholesterol lowering medication called a statin and found that 82% of RA patients stop their statin with approximately half of them never restarting it. While on treatment, most people seemed to be taking their medication as prescribed (adherence 93%).*

24. Hannan MT, **Backman CL**, Jones K. Must-read journal articles for rheumatology health professionals in 2019.

*We have searched on your behalf and found newsworthy, interesting or quirky papers published in rheumatology journals in the past year, relevant to health professionals in practice, research, & education. Take an armchair tour of selected peer-reviewed papers in rheumatology as these expert tour guides present a whirlwind excursion through 2019.*

25. Hanly J, Li Q, Su L, Urowitz M, Gordon C, Bae SC, Romero-Diaz J, Sanchez-Guerrero J, Bernatsky S, **Clarke AE**, Wallace DJ, Isenberg DA, Rahman A, Merrill J, **Fortin P**, Gladman D, Bruce I, Petri M, Ginzler EM, Dooley MA et al. Peripheral nervous system disease in systemic lupus erythematosus: results from an international inception cohort study.

*We determined the frequency, clinical characteristics, associations and outcomes in different types of peripheral nervous system (PNS) diseases in a prospective, multi-ethnic/racial, cohort of systemic lupus erythematosus (SLE) patients. There were 161 PNS events in 7.6% of the patients. The majority of PNS events were attributed to SLE. The outcome is favourable for most patients, but several factors associated with longer time to resolution were identified.*

26. Harkness T, Fu X, Zhang Y, **Choi HK**, Stone J, Blumenthal K, Wallace Z. Serum IgG4 concentrations differ according to race and sex.

*Diagnoses of IgG4-related disease, an inflammatory disorder that can affect any organ, are supported by elevated IgG4 concentrations (an antibody found in blood serum). IgG4 concentrations were found to differ according to race and sex.*

27. Holdren M, Schieir O, Bartlett SJ, Bessette L, Boire G, **Hazlewood G**, Hitchon C, Keystone E, Tin D, Thorne C, Bykerk V, Pope J and Canadian Early Arthritis Cohort (CATCH) Investigators. Maximal improvement in fatigue lags behind achievement of sustained remission in early rheumatoid arthritis.

*We examined the relationship between disease activity and fatigue over time in early rheumatoid arthritis. Early treatment response within 3-months predicted short and long-term improvements in fatigue over time.*

28. **Hudson M**, Maltez N, Ivory C, Demery-Varin M. Cyclophosphamide for the treatment of skin fibrosis in systemic sclerosis: a systematic review.

*We performed a systematic literature review to assess the effectiveness of cyclophosphamide (a medication that slows down the immune system) in scleroderma. We found evidence that it is associated with a reduction in skin fibrosis. Cyclophosphamide is therefore a reasonable treatment option in severe scleroderma.*

29. Jetha A, Tucker L, Bowring J, **Backman CL**, Proulx L, Kristman V, Hael EM, Perlin L, Gignac MAM. It starts at work: the relationship between workplace supports and presenteeism among young adults with rheumatic disease.
- In this study of 412 young adults with arthritis (18-35 years), the workplace supports most frequently needed were scheduling flexibility, drug coverage, paid sick leave, and modified job duties. Half the group said their needs were met or exceeded at work. When workplace support needs were exceeded, young adults with arthritis were 50% less likely to report “presenteeism” (attending work but unable to do job duties) than those who said their needs were met or unmet. Employers offering a wide range of workplace supports can help young adults sustain employment early in their careers.*
30. Jetha A, Tucker L, Bowring J, **Backman CL**, Proulx L, Kristman V, Gignac MAM. Casting a wide net: comparing strategies for recruiting 18-35-year-olds with rheumatic disease as study participants.
- We used three ways to recruit 412 young adults 18-35 years old for a study on arthritis and work. Recruiting through rheumatology clinics gave us only 6% of the sample; community organizations provided 19% of the sample; and the majority (75%) were reached by hiring a commercial research firm. There were some important differences among study participants based on how they were recruited.*
31. Jorge A, **Lu N**, **Choi HK**, **Esdaile JM**, **Lacaille D**, **Avina-Zubieta JA**. Hydroxychloroquine use and cardiovascular events among patients with systemic lupus erythematosus and rheumatoid arthritis.
- We conducted a study in patients with systemic lupus erythematosus and rheumatoid arthritis to determine the impact of hydroxychloroquine use on cardiovascular events. We found that current hydroxychloroquine use was associated with a reduction in heart attack, stroke and lung clots.*
32. Jorge A, **Lu N**, **Choi HK**. Opioid prescription use among patients with rheumatic disease: a population based cohort study.
- We examined opioid prescription patterns in patients with rheumatic disease from 2000 to 2016. Rates of opioid prescriptions increased over time, plateauing between 2012 and 2016, when nearly half of fibromyalgia patients, over one-third of chronic inflammatory arthritis patients, and nearly one-quarter of systemic autoimmune rheumatic disease patients received prescriptions.*
33. Jorge A, **Lu N**, **Choi HK**. Contemporary prescription opioid use and predictors among patients with systemic lupus erythematosus.
- We assessed prescription patterns of weak opioids (e.g., codeine) and strong opioids (e.g., morphine) in lupus patients. Nearly one-third of lupus patients were prescribed weak opioids and 10% were prescribed strong opioids.*
34. Kim H, Lefebvre F, Hoa S, **Hudson M**. Mortality and morbidity in scleroderma renal crisis: a systematic literature review.
- Kidney crisis is a rare but deadly complication of scleroderma. It is characterized by severe hypertension and kidney failure. We reviewed the literature on outcomes of scleroderma renal crisis. We found that mortality improved in the 1970s with the introduction of ACE inhibitors. However, there have been no further improvements. There is a strong need to identify new treatments for this problem.*

35. **Kopec JA, Cibere J, Lu N, Xie H, Avina-Zubieta JA, Esdaile J.** Trends in prescribing of NSAIDs and opioids among osteoarthritis patients in British Columbia, Canada, 1998-2014.
- We found important changes in the pattern of prescribing analgesics in BC during the study period. Declines in non-steroidal anti-inflammatory drugs such as aspirin and ibuprofen (NSAIDs) may have been compensated by increased prescriptions for opioids. This is likely to change as new guidelines discourage the long-term use of opioids as a consequence of the opioid crisis.*
36. **Kopec JA, Sayre EC, Okhmatovskaia A, Cibere J, Li L, Bansback N, Wong H, Esdaile J.** Impact of hypothetical changes in the use of analgesics on the burden of osteoarthritis: a population-based microsimulation study.
- We assessed the impact of hypothetical changes in the use of analgesics on the quality-adjusted life years (QALYs) among persons with OA in the general population. We found a beneficial but relatively small impact on QALYs of more aggressive treatment of OA with acetaminophen and opioids, and no benefit from increasing NSAIDs. A limitation of the current model is that it does not consider the long-term harmful effects of opioids, including addiction and overdose.*
37. **Kummerle-Deschner JB, Sturm D, Benseler S.** Tocilizumab – an effective rescue therapy for refractory unclassified autoinflammatory diseases in children.
- We evaluated tocilizumab (TMB) as a treatment option for patients with unclassified autoinflammatory diseases and found it to be an effective treatment option.*
38. **Laaouad L, Roberts J, Ennis D, Ye C, Al jumaily K, Hudson M, Jamal S, Pope J, Nevskaya T, Saltman A, Himmel M, Fifi-Mah A, Tisseverasinghe A, Maltez N,, Colmegna I, Hoa S.** Preexisting autoimmune disease and rheumatic immune-related adverse events associated with cancer immunotherapy: a case series from the Canadian Research Group of Rheumatology in Immuno-Oncology (CanRIO).
- Immune checkpoint inhibitors (ICI) are medications that harness the immune system to fight cancer. However, adverse events are common complications of ICI. In patients with pre-existing autoimmune diseases, such as rheumatoid arthritis, psoriasis and spondyloarthritis, exposed to ICIs, there was an increase in disease flares. However, these complications responded well to treatment. Pre-existing autoimmune disease is not a contraindication to ICI.*
39. **Legge A, Kirkland S, Rockwood K, Andreou P, Bae SC, Gordon C, Romero-Diaz J, Sanchez-Guerrero J, Wallace DJ, Bernatsky S, Clarke AE, Merrill J, Ginzler EM, Fortin P, Gladman D, Urowitz M, Bruce I et al.** Prediction of organ damage accrual in systemic lupus erythematosus using a frailty index.
- The Systemic Lupus International Collaborating Clinics frailty index predicts damage in patients with systemic lupus erythematosus (SLE) and supports the frailty index as a valid health tool for SLE.*
40. **Li LC, Xie H, Lu N, Shaw C, Gromala D, Backman CL, Tam J, Noonan G, Avina-Zubieta A, Hoens A, Townsend A, Feehan L.** Efficacy of a counselling program to promote physical activity in people with inflammatory arthritis.
- Being physically active is important for people with arthritis to stay healthy. In a study of 118 people with rheumatoid arthritis or lupus, we found those who completed a telephone counselling program with a physiotherapist and the use of a Fitbit had less pain, compared to people who managed on their own. Interestingly, we found people with rheumatoid arthritis became more active after the 8-week program, but not those with lupus.*

41. **Li LC, Xie H, Lu N, Gromala D, Shaw C, Backman CL, Tam J, Noonan G, Avina-Zubieta JA, Hoens A, Townsend A, Feehan L.** Efficacy of a 3-month wearable-enabled physical activity counselling program for people with knee osteoarthritis.
- A year ago, we showed that an 8-week physiotherapist-led counselling program, with the use of a Fitbit, improved step count and quality of life in people with knee osteoarthritis. This time, in a study of 51 people, we showed that the program improved physical activity even 4 weeks after the counselling component ended. On average, people who completed the program were physically active 13 minutes more per day compared to those who managed on their own.*
42. **Li LY, Lu N, Kopec J, Esdaile J, Xie H, Avina-Zubieta JA.** Trends in non-steroidal anti-inflammatory drugs (NSAIDs) and opioids among patients with systemic lupus erythematosus: a population-based study.
- Our study described the trends in prescribing of non-steroidal anti-inflammatory drugs (NSAIDs) and opioids among patients with SLE in the general population and shows that the use of NSAIDs was decreasing between 1998 and 2014, compared with the increasing use of some opioids, for example, tramadol (became the second most common opioid since 2012).*
43. **Li LY, Lu N, Sayre E, Xie H, Lacaille D, Esdaile J, Avina-Zubieta JA.** The risk of venous thromboembolism in patients with psoriatic disease and rheumatoid arthritis, a population-based study.
- Venous thromboembolism (VTE) refers to a blood clot that starts in a vein. We demonstrated that patients with psoriatic disease and rheumatoid arthritis have a 12% and 46% increased risk of VTE compared with the general population. The risk peaked in the first year after diagnosis and decreased with time thereafter.*
44. **Li LY, Xie H, Sayre E, Avina-Zubieta JA.** Risk of cardiovascular disease associated with the use of glucocorticoids in patients with incident systemic lupus erythematosus: a population-based study.
- Even though lupus itself predisposes patients to a high risk of cardiovascular disease (CVD), we examined the effect of drugs that are used to treat SLE, such as glucocorticoids (GC). Starting GC's caused an 82% increase in CVD. Higher risk of CVD is also associated with current GC use, higher current and cumulative GC dose and longer duration of GC use.*
45. **Li LY, Lu N, Sayre E, Xie H, Lacaille D, Esdaile J, Avina-Zubieta JA.** Risk of venous thromboembolism in rheumatoid arthritis patients initiating biologic and non-biologic DMARDs, a population-based study.
- We looked at how common VTE risk is among biologic DMARD users compared to conventional DMARD users in RA patients and found that biologic DMARD users have a higher risk of VTE.*
46. **Lim L, Cheung D, Mohamed K, Lacaille D, Pullenayegum EM, Hitchon C.** Longitudinal work transitions in early inflammatory arthritis patients: are there targets for intervention to improve employment?
- We found that employment states in early inflammatory arthritis patients changed dynamically over time. Even individuals who had no income or were work disabled at diagnosis had increased probabilities of moving into a working state over time.*

47. Lundon K, Inrig T, Paton M, Shupak R, Kennedy C, McGlynn M, **Barber C**. Measuring advanced /extended practice roles in arthritis and musculoskeletal care in Canada: stand up and be counted too!

*Caring properly for patients with arthritis and musculoskeletal diseases will require specially-trained healthcare professionals like physical and occupational therapists, and nurses. While programs for this exist, there are challenges that must be addressed so more people can be trained.*

48. **Ma JK**, Adamjee L, **Collins JA**, **Davidson E**, **English K**, **Hoens AM**, **Tsui K**, **McQuitty S**, **Sequeira L**, **Li LC**. Strength training for people with rheumatoid arthritis: barriers, facilitators, and tailoring considerations.

*We examined patient-identified barriers, facilitators, and ways to assess and customize prescription strategies when designing interventions to improve strength training participation among people with rheumatoid arthritis. Barriers include remembering how to perform exercises and knowing how much strength training is safe. Exercise participants highlighted the need to understand their individual situation.*

49. Mahler M, Roup F, Bentow C, **Hudson M**, Baron M, **Choi M**, Fritzler M. Anti-RNPC-3 Antibodies are associated with nuclear speckled immunofluorescence pattern and enriched in triple negative systemic sclerosis patients.

*There is an urgent need to identify new diagnostic tests for patients with scleroderma. We developed a new test for an antibody against RNPC-3. It could be especially useful to identify patients with scleroderma who do not have the "typical" autoantibodies, namely anti-Scl-70, anti-centromere and anti-RNA Polymerase III.*

50. Mak A, Cheung M, Leong WYJ, Dharmadhikari B, Ye Kow N, Petri M, Manzi S, **Clarke A**, Aranow C, Arnaud L, Askanase A, Bae SC, Bernatsky S, Bruce I, **Fortin P** et al. Glucocorticosteroid usage and major organ damage in patients with systemic lupus erythematosus – meta-analyses of observational studies published between 1979 and 2018.

*Independent of systemic lupus erythematosus disease duration, long term prednisone doses were associated with higher rates of cardiovascular disease and cataracts. In addition, higher rates of heart attacks were associated with overall glucocorticosteroid use.*

51. Maksymowych WP, Carmona R, **Chan J**, Yeung J, Aydin SZ, Martin L, Masetto A, Mosher D, Ziouzina O, Keeling S, Rohekar S, Dadashova R, Paschke J, Carapellucci A, Lambert R. Description and prevalence of spondyloarthritis in unselected patients with psoriasis, acute anterior uveitis, and inflammatory bowel disease presenting with undiagnosed back pain.

*Our aims were to 1) determine the percentage of patients with axial spondyloarthritis (an inflammatory arthritis affecting the spine) among those referred to rheumatologists, and 2) identify the characteristics that define these patients. In this sample, 47.6% were diagnosed and common characteristics included inflammatory back pain, male gender, and genetic markers.*

52. Maksymowych WP, Carmona R, **Chan J**, Yeung J, Aydin SZ, Martin L, Masetto A, Mosher D, Ziouzina O, Keeling S, Rohekar S, Dadashova R, Paschke J, Carapellucci A, Lambert R. What is the impact of MRI on the performance of the ASAS Classification criteria in patients presenting with undiagnosed back pain.

*We examined how MRI assessment in patients with undiagnosed back pain aided in making diagnoses of axial spondyloarthritis. There was a decrease in the ability to correctly diagnose individuals following the addition of MRI assessment, possibly due to more false-positive diagnoses.*

53. Maksymowych WP, Carmona R, **Chan J**, Yeung J, Aydin SZ, Martin L, Masetto A, Mosher D, Ziouzina O, Keeling S, Rohekar S, Dadashova R, Paschke J, Carapellucci A, Lambert R. Performance of the ASAS classification criteria presenting with undiagnosed back pain: data from the screening in axial spondyloarthritis in psoriasis, iritis, and colitis cohort.
- We tested the performance of the Assessment of SpondyloArthritis (ASAS) classification criteria in patients with undiagnosed back pain who presented with psoriasis, colitis, or acute anterior uveitis (inflammation of the skin, colon, or eye, respectively). The ASAS criteria performed less well in this cohort of patients than in other cohorts, particularly in patients with uveitis.*
54. Maksymowych WP, Carmona R, **Chan J**, Yeung J, Aydin SZ, Martin L, Masetto A, Mosher D, Ziouzina O, Keeling S, Rohekar S, Dadashova R, Paschke J, Carapellucci A, Lambert R. Enhanced performance of the ASAS classification criteria by deletion of non-discriminatory clinical items: data from the screening in axial spondyloarthritis in psoriasis, iritis, and colitis cohort.
- The Assessment of SpondyloArthritis (ASAS) classification criteria are used to diagnose spondyloarthritis (SpA), an inflammatory arthritis of the spine. Certain components of the ASAS criteria were not helpful in discriminating SpA: response to pain medications, family history of SpA, heel inflammation, arthritis at large joints, fingers or toes.*
55. Maltez N, Puyade M, Lansiaux P, Wang M, Baron M, Colmegna I, Farge D, **Hudson M**. Longitudinal changes in health –related quality of life in systemic sclerosis treated with autologous hematopoietic stem cell transplant compared to standard of care.
- We compared health-related quality of life (HRQoL) between scleroderma patients treated either with stem cell transplantation or usual care. We found that patients who underwent transplant had much better physical, but not mental, HRQoL compared to those treated with usual care.*
56. **McCormick N**, Wallace ZS, Sacks CA, Hsu J, **Choi HK**. Decomposition analysis of spending and price trends for biologic anti-rheumatic drugs in Medicare and Medicaid.
- Spending on biologic arthritis medications in the US Medicare and Medicaid programs doubled over five years, from \$3.8 billion to \$8.6 billion, mainly from price increases (higher cost/dose). This hurts taxpayers and patients who, even with insurance, pay more out-of-pocket for these specialty drugs when prices go up.*
57. **McCormick N**, Wallace ZS, Yokose C, Jorge AM, Sacks CA, Hsu J, **Choi HK**. From a potential solution to part of the problem: analysis of spending and price trends for brand-name and generic colchicine and other gout medications.
- Spending on gout medications in the US Medicare and Medicaid programs nearly doubled, reaching \$868 million in 2017. While more people are receiving urate-lowering drugs, prices are higher for those drugs and for colchicine, which now costs ~\$5/pill in the USA but only ~0.50¢/pill in Canada.*
58. **McCormick N**, Lu N, Rai SK, Yokose C, Zhang Y, **Choi HK**. Population impact attributable to modifiable risk factors for hyperuricemia and the fallacy of the variance explained.
- Among 14,624 adults from across the USA, overweight and unhealthy diet were the biggest risk factors for high uric acid levels, a precursor to gout. Public health efforts supporting healthier diets and lifestyles could prevent many gout cases.*

59. McDermott G, Fu X, Stone J, Zhang Y, **Choi HK**, Wallace Z. Cigarette smoking is a risk factor for ANCA-associated vasculitis.

*Being a current or former smoker was associated with an increased risk of ANCA-associated vasculitis, a group of diseases characterized by destruction and inflammation of small blood vessels.*

60. Meyer A, Troyanov Y, Drouin J, Bourre-Tessier J, Oligny-Longpre G, Landon-Cardinal O, Hervier B, How S, Mansour AM, Rich E, Goulet JR, Chartrand S, **Hudson M**, Nehme J, Makhzoum JP, Zarka F, Hussein S et al. Treating statin-induced anti-HMGCR myopathy with normal muscle strength: a new window of opportunity.

*We studied patients with statin-induced muscle disease. We found that those treated early, when their muscle strength was preserved, required less steroids. This suggests that there may be a window of opportunity to treat this serious muscle disease.*

61. Meyer A, Leclair V, Landon-Cardinal O, Ellezam B, D'Aoust J, Giannini M, Geny B, Arnaud L, Gottenberg JE, Sibilia J, Satoh M, Frizler M, Troyanov Y, **Hudson M**. ACR/EULAR criteria for myositis and systemic sclerosis lack sensibility for scleromyositis.

*Only a portion of patients with both scleroderma and myositis (scleromyositis) meet classification criteria for either scleroderma or myositis. It is therefore possible that these patients are under-represented in clinical studies. We need to expand current criteria to capture these patients better.*

62. Powell M, Bykerk V, Schieir O, Valois MF, **Bartlett SJ**, Bessette L, Boire G, Hitchon C, Keystone E, Pope J, Thorne C, Tin D, **Hazlewood G**. Patterns of sustained remission and subsequent DMARD tapering in early rheumatoid arthritis: data from the Canadian Early Arthritis Cohort.

*We found that achieving sustained remission occurred in 40% of the early rheumatoid arthritis patients in usual clinical practice and treatment reductions following sustained remission occurred in over a third of patients over the next 12 months. Reductions consisted mainly of adjustment in non-biologic DMARDS.*

63. Rahman P, Arendse R, Fortin I, Chow A, Khraishi M, Kapur S, Zimmer M, Kherani R, **Chan J**, Rampakakis E, Rachich M, Asin-Milan O, Lehman A, Nantel F. Long-term effectiveness and safety of infliximab, golimumab and ustekinumab in psoriatic arthritis patients from a prospective observational registry.

*Patients with psoriatic arthritis were treated with infliximab, golimumab, or ustekinumab (all immune-suppressing medications) and followed-up to describe the long-term real-world effectiveness and safety of these medications. The three medications were associated with significant improvements in all disease symptoms over time, each with similar efficacy.*

64. Roberts J, Ennis D, **Hudson M**, Ye C, Saltman A, Hoa S, Pope J, Himmel M, Maltez N, Fifi-Mah A, Tisseverasinghe A, Rottapel R, Al Jumaily K, Ly C, Cartagena L, **Jamal S**. Rheumatic immune related adverse events associated with cancer immunotherapy: a nationwide multi-centre Canadian cohort from the Canadian Research Group of Rheumatology in Immuno-oncology (CanRIO).

*Immune checkpoint inhibitors (ICI) are medications that harness the immune system to fight cancer. However, side effects are common complications of ICI. We identified a large group of cancer patients who developed arthritis due to ICI. The most common were inflammatory arthritis and muscle diseases then soft tissue complications. Most patients responded well to treatment and also had good cancer outcomes.*

65. Schieir O, **Bartlett SJ**, Valois MF, Bessette L, Boire G, **Hazlewood G**, Hitchon C, Keystone E, Pope J, Thorne C, Tin D, Bykerk V, and Canadian Early Arthritis Cohort (CATCH) Investigators. Real-world remission outcomes in the first year following RA diagnosis vary considerably with the Disease Activity Index used and a sizable proportion have persistent active disease across all measures: results from the Canadian Early Arthritis Cohort (CATCH).

*A Clinical Disease Activity Index (CDAI) for early rheumatoid arthritis (ERA) needs only clinical data. We compared remission rates in the first year after RA diagnosis across 4 commonly used CDAI's. All indices were similar, however unmet needs existed for achieving remission in approximately 1 in 3 ERA patients.*

66. Sevim E, Zisa D, Andrade D, Pengo V, Sciascia S, Tektonidou M, Ugarte A, Gerosa M, Belmont HM, Lopez-Pedraza R, Ji L, **Fortin P**, Efthymiou M, and on behalf of APS ACTION et al. The clinical and laboratory characteristics of antiphospholipid antibody positive patients included in the AntiPhospholipid Syndrome Alliance for Clinical Trials and InternatiOnal Networking (APS ACTION) Clinical Database and Repository ("Registry").

*We describe the characteristics of patients from the APS ACTION Registry. Overall, 172 (21%) had antibodies without the syndrome, 453 (56%) had APS with blood clots; 73 (9%) had APS only related to pregnancy; and 106 (13%) had APS related to blood clots and pregnancy. One-fifth of APS ACTION patients do not fulfill clinical APS classification criteria.*

67. **Szlachetka T**, Li L, Liu-Ambrose T, **Xie H**, **Sayre E**, **Lacaille D**. Determinants of cognitive function in rheumatoid arthritis patients.

*Memory impairment was prevalent among our sample of patients with rheumatoid arthritis (RA). Poor physical function, comorbidities, such as depression, and having fibromyalgia, are associated with impaired memory in RA. More research is needed to improve how memory impairment is managed in RA.*

Taghavi M, Barbhaiya M, Tektonidou M, **Fortin P**, Andrade D, Knight J, Artim-Esen B, Atsumi T, Cohen H, Ji L, Sciascia S et al. Descriptive analysis of biopsy-proven antiphospholipid antibody-associated nephropathy patients included in the AntiPhospholipid Syndrome Alliance for Clinical Trials and InternatiOnal Networking (APS ACTION) Clinical Database and Repository ("Registry").

*The kidney is a major target organ in AntiPhospholipid Syndrome with one complication being arterial lesions as described in renal biopsy reports. We found that the terms used by pathologists while reporting the biopsy findings varies and international consensus is needed to update and harmonize the terminology used to describe this phenomenon.*

68. Tatangelo M, Tomlinson G, Keystone E, Paterson M, **Bansback N**, Bombardier C. The effect of rheumatoid arthritis and biologics on the acquisition of subsequent diseases and adverse events: a matched longitudinal population study.

*We will examine whether individuals with RA in Ontario are more likely to have comorbidities and whether biologics can increase or decrease these. To date, the work confirms that people with RA accrue more comorbidities over time than people without RA.*



69. **To-Miles F**, Forwell S, Puterman E, **Collins JA**, **Leblanc K**, **Backman C**. The health-promoting potential of everyday activities: Preliminary results from an exploratory study of adults with and without inflammatory arthritis.
- Adults with inflammatory arthritis IA reported their daily activities to be more creative, valued, controlled, and engaging than did those without. This suggests people with IA are either more aware, or choosier, about what they do. When both groups are analyzed together, increased telomere length and engagement of difficult or stressful activities were most strongly associated with higher mental health ratings.*
70. Urowitz M, Gladman D, Su J, Farewell V, Sanchez-Guerrero J, Romero-Diaz J, Bae SC, **Fortin P**, Nived O, **Clarke AE**, Bernatsky S, Gordon C, Hanly J, Wallace DJ, Isenberg DA, Rahman A, Merrill J et al. Incidence and predictors of atherosclerotic vascular events in a multicenter inception systemic lupus erythematosus cohort.
- Certain medications (antimalarials) and being female reduce the risk of atherosclerotic event in lupus patients. In patients with antiphospholipid antibodies (APLA) in their blood, similar factors were protective, but the APLA, disease activity and body weight could indicate increased risk for atherosclerotic event too.*
71. Van Dyk J, Heard B, **Barnabe C**. Principal component analysis identifies unique sub-populations in rheumatoid arthritis using a combination of serological biomarkers: a cross sectional study.
- We used an analysis technique, called Principal Component Analysis, to examine which factors, such as patient characteristics (age, gender, socioeconomic status), disease activity markers, and environmental exposures, predict rheumatoid arthritis (RA) severity. Inflammation levels and blood markers for RA were the most important predictors for RA severity.*
72. Wallace Z, Fu X, Zhang Y, Stone J, **Choi HK**. The association of reduced low-density lipoprotein (LDL) cholesterol levels with ANCA-associated vasculitis (AAV).
- In evaluating the association between ANCA-associated vasculitis (AAV) (a group of diseases characterized by destruction and inflammation of small blood vessels) and lipid levels, we found that one type of cholesterol level was significantly lower in AAV patients compared to disease-free individuals in the first year following treatment initiation, but similar thereafter.*
73. Wallace Z, Yun H, Curtis J, Yang S, Chen L, Stone J, **Choi HK**. ANCA-associated vasculitis management in the United States: data from the RISE registry.
- We examined treatment patterns for ANCA-associated vasculitis, a group of diseases characterized by destruction and inflammation of small blood vessels. There was wide variation in disease management at different time points but these variations were similar across geographic regions in the United States.*
74. Wallace Z, Fu X, Harkness T, Stone J, Zhang Y, **Choi HK**. Causes of death in ANCA-associated vasculitis according to ANCA type.
- We examined cause of death in patients with two types of ANCA-associated vasculitis (a group of diseases characterized by destruction and inflammation of small blood vessels): MPO-ANCA+ and PR3-ANCA+. MPO-ANCA+ patients are at higher risk of death from cardiovascular disease than PR3-ANCA+ patients.*

75. Wallace Z, Harkness T, Fu X Stone J, **Choi HK**. Treatment delays associated with prior authorization for infusible medications; a cohort study.  
*Prior authorizations (PA) are commonly required as cost-containment strategies for expensive medications, including certain rheumatology medications such as biologics taken by IV infusion. We found that PA requirements for infusible medications are associated with delays in treatment.*
76. Wallace Z, Harkness T, Blumenthal K, **Choi HK**. Increasing capacity and reducing costs of rituximab administration.  
*We performed an economic evaluation of rituximab (RTX), a medication used in the treatment of autoimmune diseases and certain cancers. We found that drug price is the primary driver of the cost of RTX treatment and that varying non-drug factors has minimal impact on overall costs.*
77. Wallwork R, Harkness T, Fu X, Perugino C, **Choi HK**, Stone J, Wallace Z. Early mortality in IgG4-related disease.  
*Mortality rates of patients with IgG4-related disease (an inflammatory disorder that can affect any organ) were calculated. We observed a trend suggesting that male IgG4-related disease patients may have a higher rate of death compared to the general population.*
78. Wang L, Miloslavsky E, Stone J, **Choi HK**, Zhou L, Wallace Z. A retrospective cohort study using clinical notes and latent topic modeling to characterize the natural history of ANCA-associated vasculitis.  
*Clinic notes of patients with ANCA-associated vasculitis (a group of diseases characterized by destruction and inflammation of small blood vessels) were evaluated to capture trends in topics such as treatment, symptoms, and complications.*
79. Yokose C, **Rai S**, **Lu N**, **McCormick N**, Curhan G, **Choi HK**. The effects of a low-fat, Mediterranean, or low-carbohydrate diet on serum urate.  
*The objective of this study was to determine the effects of three established weight loss diets (i. low-fat restricted calorie; ii. Mediterranean restricted calorie; iii. low-carbohydrate non-restricted calorie) on serum urate levels. All three diets significantly lowered serum urate levels and improved cardiovascular risk factors.*
80. Yokose C, Eide S, Simeone J, **Shojania K**, Nicolaou S, Becce F, **Choi HK**. Frequently encountered artifacts in novel application of dual-energy CT to vascular imaging: a pilot study.  
*Gout occurs when monosodium urate (MSU) crystals form in joints and soft tissues, eliciting an inflammatory response. We reviewed CT scans of lung blood vessels to identify commonly encountered artifacts (false positive results) which could be misconstrued as true MSU crystallizations.*
81. Yokose C, **Lu N**, Chen-Xu M, **McCormick N**, Pillinger M, Zhang Y, **Choi HK**. Subtypes of gout based on comorbidity patterns among black patients in the US general population – Cluster Analysis of the National Health and Nutrition Examination Survey 2007-2016.  
*The objective was to identify subtypes of gout based on the simultaneous presence of other chronic diseases in black adult patients. Overall, 5 subtypes were identified; individuals with gout had one of: 1) dyslipidemia/hypertension, 2) diabetes, 3) isolated gout, 4) chronic kidney disease, or 5) heart disease.*

82. Yokose C, Jorge A, D'Silva K, Serling-Boyud N, Matza M, Nasrallah M, Keller S, Oza A, **Choi HK**, Bolster M. Using electronic visits (E-Visits) to achieve goal serum urate levels in patients with gout in a rheumatology practice: a pilot study.

*Patients were enrolled in an electronic-visit (E-visit) program, which consisted of electronic health-related questionnaires, educational information, and reminders about laboratory testing, all of which were reviewed by patients' physicians. The E-visit program led to an improvement in the proportion of patients achieving goal serum urate levels.*

83. Yoshida K, Lin TC, Wei MY, Malspeis S, Chu SH, Camargo C, Raby B, **Choi HK**, Tedeschi SK, Barbhaya M, Lu B, Costenbader K, Karlson E, Sparks J. Accrual of multimorbidity after incident rheumatoid arthritis and matched comparators using a large prospective cohort with 30 years of follow-up.

*Rheumatoid arthritis (RA) patients often suffer from multimorbidity (two or more simultaneous chronic medical conditions). We assessed the trajectories of multimorbidity in women both with and without RA and found that RA patients accrued multimorbidity more rapidly than non-RA patients.*

84. Zheng B, Wang M, Fritzler M, **Choi M**, Baron M, **Hudson M**. Systemic sclerosis auto-antibody profiles predict interstitial lung disease onset but not progression.

*Interstitial lung disease (ILD) is one of the most serious complications of scleroderma. We found that the onset of ILD differed depending on a patient's autoantibody profile. However, once present, ILD progressed at the same rate, regardless of autoantibody profile.*

85. **Zheng Y, Xie H, Avina-Zubieta JA, Yazdani K, Esdaile JM, Lacaille D**. The socioeconomic, gender, urban-rural, and regional disparities in the risk of acute myocardial infarction among rheumatoid arthritis patients.

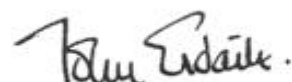
*Using British Columbia population data, we found that low income, male, or rural rheumatoid arthritis patients have a higher risk of heart attack. Living in remote communities, such as Interior and Northern areas, are also associated with a higher risk of heart attack.*

### **Congrès annuel de la société française de rhumatologie, Paris, France, 10 décembre 2019.**

1. Ajlil Y, Gauvreau A, Fournier F, Ratelle L, Gagnon E, Beaudreuil J, Petit-Teixeira E, Droit A, **Michou L**. Identification de variants génétiques rares dans des formes familiales de la maladie de Dupuytren. (TRANSL.) Identification of rare genetic variants in familial forms of Dupuytren's disease.

*Dupuytren's disease is the most common heritable disorder of the connective tissues, mostly affecting Northern Europeans. To understand the genetic component of this disease, we performed a wide genetic analysis in relatives belonging to three large familial forms of Dupuytren's disease, displaying an autosomal dominant pattern of inheritance. (Offspring who get the gene variation from only one parent can get the disease).*

Signed:



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John M. Esdaile, MD, MPH, FRCPC, MAHS  
Scientific Director, Arthritis Research Canada