

Prednisone prescribing for rheumatoid arthritis management in primary care

Mixed-methods study of trends and patient perspectives

Anh N.Q. Pham PhD Sharon D. Koehn PhD Neil Drummond PhD Scott Garrison MD PhD
Claire E.H. Barber MD PhD Doug Klein MD MSc FCFP Lisa Jasper PT PhD C. Allyson Jones PT PhD

Abstract

Objective To examine patterns of prednisone prescribing for rheumatoid arthritis (RA) management in primary care settings; and to explore experiences and perspectives of family physicians (FPs) and people living with RA regarding prednisone use.

Design Mixed-methods study with sequential exploratory design.

Setting Canada, particularly Alberta.

Participants Overall, 546 patients with RA in primary care electronic medical records in southern Alberta after excluding short-term prednisone prescriptions, 33 people living with RA from across Canada, and 16 primary care providers (14 family physicians, 1 clinic manager, 1 pharmacist).

Methods Qualitative interviews and focus groups guided the analysis of primary care electronic medical records linked with provincial pharmaceutical dispensing data. Patterns of prednisone dispensing over 12 years, factors associated with prednisone use before and after RA documentation, and qualitative experiences with prednisone therapy were examined.

Main findings Each year between 2008 and 2019, at least 40% of patients with established RA received at least 1 prednisone prescription. Of patients receiving both prednisone and disease-modifying antirheumatic drugs (DMARDs) (41%, n=210), a subset (n=92) received prednisone before starting DMARDs, with 66% continuing prednisone for more than a year after DMARD initiation. Median time between first prednisone prescription and DMARD initiation was 124 days (interquartile range=13 to 1150 days). Three main qualitative themes were identified: prednisone is used as bridging therapy during the wait time to see a specialist, patients and providers have concerns about long-term use and side effects, and systemic barriers affecting access to guideline-concordant care exist and particularly impact male patients.

Conclusion Current prednisone prescribing patterns in RA management reveal divergence from guidelines recommending short-term use, suggesting systemic barriers to guideline-concordant care. Improving outcomes requires addressing both clinical needs driving prednisone use and systemic barriers perpetuating reliance on this medication.

Prescrire la prednisonne pour prendre en charge l'arthrite rhumatoïde en soins primaires

Étude à méthodes mixtes des tendances et des points de vue des patients

Anh N.Q. Pham PhD Sharon D. Koehn PhD Neil Drummond PhD Scott Garrison MD PhD
Claire E.H. Barber MD PhD Doug Klein MD MSc FCFP Lisa Jasper PT PhD C. Allyson Jones PT PhD

Résumé

Objectif Examiner les tendances dans la prescription de la prednisonne pour la prise en charge de l'arthrite rhumatoïde (AR) dans les milieux de soins primaires; et explorer les expériences et les points de vue des médecins de famille (MF) et des personnes vivant avec l'AR concernant l'utilisation de la prednisonne.

Type d'étude Étude à méthodes mixtes selon une conception exploratoire séquentielle.

Contexte Le Canada, en particulier l'Alberta.

Participants Dans l'ensemble, 546 patients atteints d'AR figurant dans les dossiers médicaux électroniques en soins primaires dans le sud de l'Alberta, après avoir exclu les ordonnances de prednisonne de courte durée, 33 personnes vivant avec l'AR de toutes les régions du Canada et 16 professionnels des soins primaires (14 médecins de famille, 1 gestionnaire de clinique et 1 pharmacien).

Méthodes Des entrevues qualitatives et des groupes de discussion ont orienté l'analyse des dossiers médicaux électroniques en soins primaires reliés à des données provinciales sur la dispensation de produits pharmaceutiques. Les tendances dans la dispensation de la prednisonne sur une période de 12 ans, les facteurs associés à l'utilisation de la prednisonne avant et après la documentation de l'AR, de même que les expériences qualitatives avec un traitement à la prednisonne ont été examinés.

Principales constatations Chaque année entre 2008 et 2019, au moins 40 % des patients atteints d'AR confirmée ont reçu au moins 1 prescription de prednisonne. Chez les patients qui recevaient à la fois de la prednisonne et des antirhumatismaux modificateurs de la maladie (ARMM) (41 %, n=210), un sous-groupe (n=92) avait pris de la prednisonne avant d'amorcer un ARMM et 66 % avaient continué la prednisonne pendant plus de 1 an après avoir commencé l'ARMM. Le temps moyen entre la première prescription de prednisonne et l'amorce d'un ARMM était de 124 jours (écart interquartile=13 à 1150 jours). Trois principaux thèmes qualitatifs ont été cernés : la prednisonne est utilisée comme thérapie transitoire durant la période d'attente pour voir un spécialiste, les patients et les cliniciens s'inquiètent de l'usage à long terme et des effets secondaires et l'existence d'obstacles systémiques nuisant à l'accès à des soins conformes aux lignes directrices, affectant en particulier les patients masculins.

Conclusion Les tendances actuelles dans la prescription de prednisonne pour la prise en charge de l'AR révèlent une divergence par rapport à son utilisation à court terme recommandée par les lignes directrices, portant à croire à l'existence d'obstacles systémiques à des soins conformes aux lignes directrices. L'amélioration des résultats exige de se pencher à la fois sur les besoins cliniques qui incitent à recourir à la prednisonne et sur les obstacles systémiques qui perpétuent la dépendance à l'endroit de ce médicament.

Rheumatoid arthritis (RA) affects about 1% of Canadians and is characterized by joint inflammation, resulting in pain, stiffness, and progressive joint damage if untreated.^{1,2} Early medication initiation is crucial to prevent permanent damage.³⁻⁵ In Canada, family physicians (FPs) are initial points of contact and care coordinators for people living with RA (PLRA) in need of rheumatology services.⁶ However, FPs face important challenges in RA management, including timely diagnosis, specialist referral, and initiating appropriate treatment,⁶⁻⁹ often exacerbated by long wait times for rheumatologist consultations.⁷⁻¹²

Glucocorticoids are used by FPs to manage RA symptoms, especially while patients await specialist care.^{8,13,14} Canadian Rheumatology Association (CRA)¹⁵ and European¹⁶ guidelines endorse short-term use of glucocorticoids combined with disease-modifying antirheumatic drugs (DMARDs) for active RA, but advise against continuous use past 3 months. The guidelines recommend tapering and discontinuing, when possible, especially after achieving remission or low-disease activity. CRA guidelines suggest short-term glucocorticoids (≤6 weeks for flares) with the lowest effective dose when initiating or changing DMARD therapy.¹⁷ They advise against routine long-term (>6 months) low-dose glucocorticoids as DMARD adjuncts, emphasizing persistent disease activity should trigger DMARD adjustment rather than continued glucocorticoid use.

Prednisone, a glucocorticoid with anti-inflammatory and immunosuppressive properties, is widely used for inflammatory, autoimmune, and allergic conditions, including RA.^{15,18} Our study aimed to provide comprehensive understanding of glucocorticoid use, specifically prednisone, in RA management in Canadian primary care. Primary objectives included the following: estimating the prevalence of prednisone use among PLRA; describing current dispensation trends; exploring patients' and primary care providers' experiences with prednisone treatment; and identifying improvements in prednisone prescribing and management for patients in primary care.

— Methods —

We used a sequential exploratory mixed-methods design, wherein qualitative research guided subsequent quantitative analysis of linked administrative health and primary care electronic medical record (EMR) data.¹⁹ Research ethics approval for the study was obtained from the University of Alberta in Edmonton, the University of Calgary in Alberta, the University of Winnipeg in Manitoba, Laval University in Quebec, and Memorial University of Newfoundland in St John's. Our interdisciplinary team included FPs, a rheumatologist, physiotherapists, epidemiologists, and a medical anthropologist.

Qualitative interviews

We conducted semistructured interviews with 33 participants with RA recruited through Arthritis Research Canada's Web-based volunteer noticeboard (n=21) and family medicine clinics in Alberta, Manitoba, Quebec, and Newfoundland and Labrador (n=12). Eligible participants 19 years or older self-identified as diagnosed with RA by a physician in Canada. Recruitment continued until thematic saturation was achieved.²⁰ The sample reflected key characteristics of the Canadian RA population, though western Canada and those with higher education are overrepresented (**Table 1**).

We conducted 3 focus groups with 16 primary care providers in Alberta (14 family physicians, 1 clinic manager, 1 pharmacist), recruited through the family

Table 1. Characteristics of people living with rheumatoid arthritis: N=33.

CHARACTERISTIC	n (%)
Sex	
• Female	30 (91)
• Male	3 (9)
Age, y	
• <40	10 (30)
• 40-59	11 (33)
• >60	12 (36)
Region	
• Western Canada	23 (70)
• Eastern Canada	10 (30)
Community size	
• Urban (>100,000)	23 (70)
• Suburban or small city	6 (18)
• Rural or remote	4 (12)
Education	
• Postsecondary	30 (91)
• High school or less	3 (9)
Self-reported economic status	
• "Comfortable"	26 (79)
• "Hard to make ends meet"	7 (21)
Time since diagnosis, y	
• <2	13 (39)
• 3-5	12 (36)
• >6	8 (24)
Time to diagnosis from symptom onset, y	
• <1	16 (48)
• 1-5	8 (24)
• >6	9 (27)

medicine departments of the University of Alberta and the University of Calgary.

Interviews of PLRA were conducted between December 2021 and November 2023 via Zoom video-conferencing software, each lasting 1 to 2 hours. The interview guide, developed through iterative consultation with the study's patient advisory committee and informed by the Candidacy Framework,²¹ explored access dimensions and treatment experiences. Hour-long provider focus groups were conducted in-person, where barriers to RA diagnosis and care were discussed. NVivo 14 was employed for analysis²² using a hybrid approach of deductive coding guided by the Candidacy Framework and inductive coding for emerging themes.^{21,23}

Linked electronic medical record and administrative data

Using the Canadian Primary Care Sentinel Surveillance Network (CPCSSN) database case definition (sensitivity 82%, specificity 98%), we identified 597 primary care patients with RA in southern Alberta (aged ≥ 19 years) who had at least 1 encounter with an FP between 2008 and 2020.²⁴ This case definition is based solely on primary care EMR data and does not require rheumatologist consultation, allowing for examination of primary care management patterns, including patients who may never have accessed specialist care. CPCSSN data from FP clinics participating in the Southern Alberta Primary Care Research Network were linked to Alberta Health Services Pharmaceutical Information Network (PIN) data, including Anatomical Therapeutic Chemical codes, Drug Identification Numbers, and number of tablets and number of days for each prescription to access dispensing information for prednisone and prescriptions ordered by ambulatory care physicians (FPs, rheumatologists, other specialists). However, PIN data do not identify the specific prescriber type for individual prescriptions, limiting our ability to differentiate between FP-initiated versus specialist-initiated treatments. Individuals with chronic obstructive pulmonary disease (COPD) or asthma with prednisone dispensations of 14 days or less were excluded, as these were most likely prescribed for non-RA-related conditions. The final cohort comprised 546 patients.

We conducted descriptive and inferential statistical analyses using Stata 14.²⁵ Dominant themes regarding medication use and influencing factors in the qualitative data informed the selection of variables for analysis in our linked data.

— Results —

The mean (standard deviation [SD]) age of the EMR sample in 2020 was 55 (16) years; females comprised 72% of the sample and 3.6% lived in rural areas. Mean (SD) age for meeting RA case criteria was 61 (16) years,

with median follow-up of 7 years (interquartile range [IQR]=3 to 9 years).

Prednisone initiation and continuation

Prednisone was discussed by 20 PLRA and in 2 provider focus groups. Similarly, in our quantitative findings prednisone accounted for 90% of oral glucocorticoid prescriptions and dispensations for patients with RA, making it the dominant treatment approach.

Each year between 2008 and 2019, around 40% or more of patients with RA received at least 1 prednisone prescription (**Figure 1**).

Prednisone as a bridge to DMARDs

Interviewees reported receiving prednisone to manage RA flares while awaiting rheumatology consultation, which was prescribed either by their FP or during emergency department visits (**Table 2**, A,B,C). Likewise, in our quantitative sample, 41% of patients (n=210) received both prednisone and a DMARD at some point (**Table 3**). Within this group, a subset of 92 patients received prednisone before starting a DMARD, with median time between first prednisone prescription and DMARD initiation of 124 days (IQR=13 to 1150 days), suggesting variable and sometimes extended waiting periods (**Table 3**).

Among 210 patients who received both prednisone and DMARDs, 16% (n=34) discontinued prednisone at DMARD initiation, 18% (n=37) continued but stopped within a year, and 66% (n=139) continued prednisone for more than 1 year after DMARD initiation. For those who eventually discontinued prednisone after starting DMARDs (n=183), the median number of prednisone dispensations was 3 (IQR=2 to 11), with median time from DMARD initiation to final prednisone prescription of 1633 days (IQR=430 to 3094 days), suggesting intermittent use over extended periods rather than continuous therapy.

Patient and provider experiences with prednisone

FPs expressed caution about prescribing prednisone, especially for patients with comorbidities. They emphasized the need for comprehensive education on risks and benefits, preferably from prescribing rheumatologists. PLRA shared providers' concerns about prednisone's side effects, including hair loss, mood changes, and impacts on fertility. Despite these concerns, some interviewees readily accepted prednisone given symptom severity, recognizing it as an effective, though imperfect, solution to their immediate pain and functional limitations. Some interviewees continued prednisone even against medical advice, driven by symptom severity (**Table 2**, D), while RA symptom intensity led some to obtain prednisone through alternative means (**Table 2**, E). Duration and intensity of prednisone use by patients could be substantial (**Table 2**, F,G).

Systemic issues and access to care

FPs were the first point of contact for most of the PLRA interviewed (29 of 33), playing a critical role in early management and specialist referral, but described being constrained by system-level barriers. Both PLRA and FPs reported variable wait times for rheumatologist appointments, ranging from less than a month to more than 2 years. Extended waiting periods challenged effective symptom management (Table 2, H). FPs described systemic barriers to specialist access, including capacity constraints and inefficient triaging processes (Table 2, I).

Some FPs had access to Specialist Link, a service in Calgary, Alta, for direct consultation with rheumatologists for advice on DMARD prescribing (Table 2, J), but others in the same city thought it was unavailable for RA. Academic FPs noted they probably had more time than fee-for-service colleagues to contact specialists directly. Correspondingly, treatment patterns in EMR data varied by primary care setting, with DMARD recipients (alone or with prednisone) more commonly treated in academic clinics (56% to 63%) than those receiving only prednisone (38%) or no treatment (47%).

A total of 48 RA patients received only prednisone for more than a year after diagnosis, with no DMARDs. Compared to other groups, this group included relatively more males and those with respiratory comorbidities (Table 3).

— Discussion —

Our study comprehensively examined prednisone use in primary care RA management, revealing complex

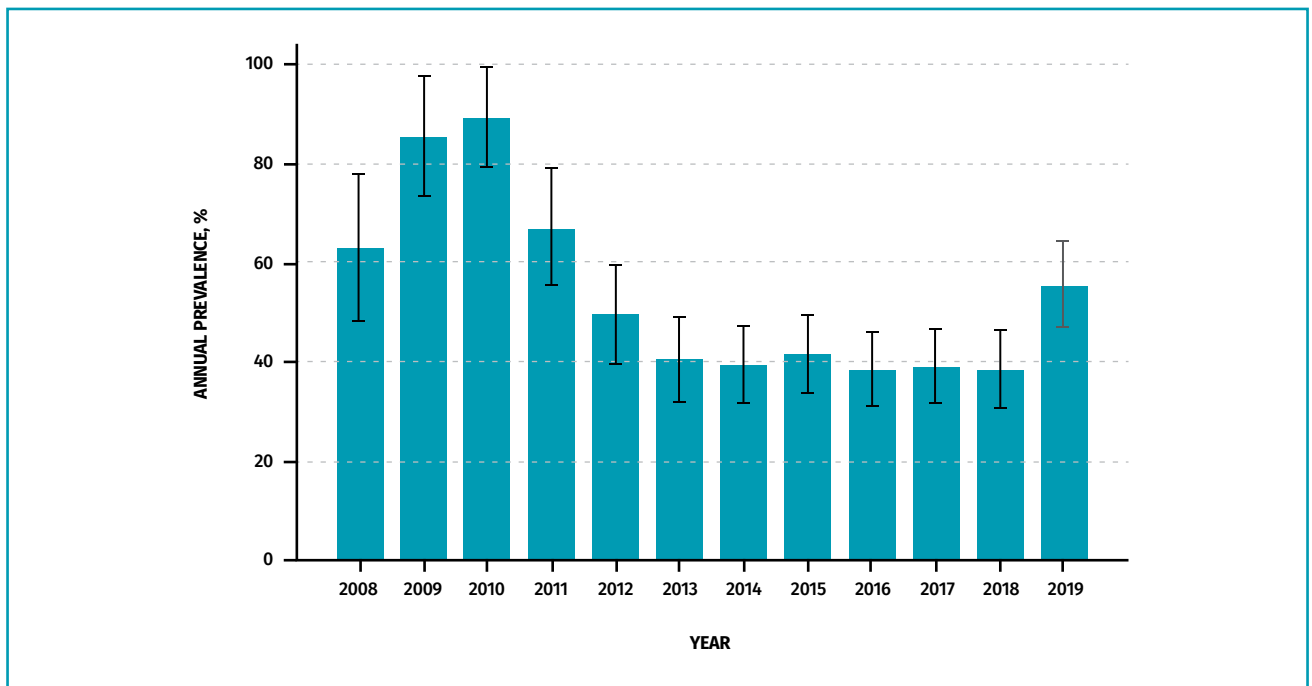
interplays between clinical practice, patient experience, and systemic challenges. Discrepancies between practice and current CRA guidelines are evident.

Annual prednisone use by 40% or more of established RA patients exceeds expectations for guideline-recommended short-term therapy (≤ 12 weeks).¹⁷ Even higher rates appear internationally: 54.3% in the COMorbidities in Rheumatoid Arthritis study across 17 countries²⁶ and 65.3% in the Early Undifferentiated Arthritis cohort over 10 years, the latter showing increased cardiovascular and infection risks with cumulative glucocorticoid exposure.²⁷

Multiple studies demonstrated that glucocorticoid use, even at low doses, is associated with increased risk of mortality and cardiovascular events.²⁷⁻³¹ Substantial delays between first prednisone prescription and DMARD initiation may reflect challenges in service provision,^{8,12} aligning with findings that primary care physicians rarely initiate DMARDs for new patients with RA,⁸ as well as limited rheumatology workforce capacity.³²

Our qualitative findings revealed diverse patient experiences with prednisone, from refusal to perceived dependency. Previous research documents physical and emotional struggles due to prednisone, including Cushing syndrome, weight gain,¹³ and severe complications like rapid cataract development.² Despite these concerns, many patients resisted discontinuation,² self-managed dosages,³³ or obtained prednisone without prescriptions.³⁴ FPs acknowledged tension between immediate symptom relief and long-term health consequences, which is consistent with the existing literature.³⁵

Figure 1. Annual prevalence and mean (95% confidence interval) of prednisone dispensed to patients with rheumatoid arthritis for each year: *Linked dataset from 2008 to 2019.*



Our finding that 66% of patients who received both prednisone and DMARDs continued prednisone for more than a year after DMARD initiation is concerning. This contrasts with a study in the United States where only 29.2% of newly diagnosed RA patients continued glucocorticoids 10 to 12 months following a diagnosis.³⁶ CRA guidelines¹⁷ recommend short-term use (8 to 12 weeks) with tapering protocols during DMARD initiation and advise against routine long-term use, instead recommending DMARD adjustment for persistent disease activity. This high continuation rate suggests system-level barriers to optimal care. The pattern of few dispensations (median=3) over extended periods suggests intermittent rather than continuous use.

Overrepresentation of male patients in the subset who received only prednisone for extended periods suggests

potential disparities in treatment patterns. Males with RA may exhibit greater reluctance to seek comprehensive care due to stoicism and challenges to masculine identity from chronic illness,³⁷ though these patterns intersect with other social determinants in complex ways that warrant further investigation.³⁸

Moreover, overrepresentation of respiratory comorbidities in prednisone-only patients reflects the common interrelationship between RA and pulmonary manifestations.³⁹ Clinical decisions are complicated when respiratory conditions, including interstitial lung disease as a direct consequence of RA, may independently warrant prolonged glucocorticoid therapy.⁴⁰ Long-term prednisone use might be appropriate for these patients despite guidelines advising against extended use for articular symptoms alone. Standard protocols

Table 2. Qualitative themes and illustrative examples of prednisone use in rheumatoid arthritis management

THEME	SUBTHEME	ILLUSTRATIVE QUOTATION OR EXAMPLE
Prednisone as a bridge to DMARDs	Initial management	<ul style="list-style-type: none"> A: "I was crashing really bad to the point that I didn't know if I could even keep working, if I had to go on leave, and [my FP] offered me prednisone. And I said no at that point, just because I was 2 weeks away from seeing the rheumatologist." (Female 01) B: "There was still a lot of pain, especially through the night.... When I went to my GP, I told him and he said, 'Why don't we up the dosage a little bit here. Feel free to go higher in the dosage of the prednisone.' And so I increased the dosage." (Male 01)
	Emergency care	<ul style="list-style-type: none"> C: "Before I [saw] the rheumatologist, I ended up in [the] emerge[ncy department]. They prescribed prednisone, but just for 5 days.... I got in within 3 weeks, but only because I impressed on them the desperation of my situation. At least the rheumatologist was able to prescribe more prednisone." (Female 02)
Concerns and experience with prednisone use	Psychological impact	<ul style="list-style-type: none"> D: "The pain got so bad that I was contemplating some bad things, so if this keeps me away from that scenario, I'm gonna do what I have to do." (Female 03)
	Alternative access	<ul style="list-style-type: none"> E: One patient (Female 04) obtained prednisone without a prescription while abroad when health insurance was unaffordable.
	Long-term use	<ul style="list-style-type: none"> F: "It was that sort of 2-year period, and I was on incredibly high doses of prednisone, like 110 mg. It took 2 years to get off the prednisone. I had to be weaned off it so slowly." (Female 05, suspected of having polymyalgia before RA diagnosed) G: "It was about a year [to get to a rheumatologist from the FP]. And so first [the FP] put me on prednisone. And that was really good. But I really was concerned about staying on prednisone and then by the time I had come off, you have to come off of it gradually, I then saw the rheumatologist." (Female 06)
Systemic issues and access to care	Wait times	<ul style="list-style-type: none"> H: "I don't feel great about giving prednisone for long-term because we know there's risks to that too, so we're trying to balance the risks and benefits." (FP1, FG1)
	Triage challenges	<ul style="list-style-type: none"> I: "I just recently had a new diagnosis of RA with, 'light up like a Christmas tree' markers and I was really quite disappointed in my access to rheum[atology]. I sent an urgent referral, I followed up with a phone call, said please put this in front of your triaging physician they're going to want to see them quickly.... Their waitlist was 6 to 8 months. I picked up the phone again and said, 'No, I'm sorry,' and had to go through ConnectMD to speak to the rheumatologist. [I] said, 'Forgive me if I'm wrong, but these are the people you want to see.' He replied, 'No, absolutely we need to see this person within a few weeks!'" (FP2, FG2)
	Specialist Link	<ul style="list-style-type: none"> J: "It was going to be 2 months before [my patient] was seen [by a rheumatologist] and she was not functioning, and could not take care of herself at home, so I gave her a week of prednisone.... [After which] she was feeling better, but the next week she had a flare of her symptoms again, so I called Specialist Link and asked them for some advice and ... they gave me some instructions about starting Plaquenil until she was seen." (FP3, FG1)

DMARD—disease-modifying antirheumatic drugs, FG—focus group, FP—family physician, GP—general practitioner, RA—rheumatoid arthritis.

for COPD and asthma also incorporate prednisone.⁴¹ Current RA guidelines inadequately address implementation of these overlapping recommendations, creating challenges for FPs and other primary care providers balancing risks against benefits for both articular and extra-articular manifestations.

Patients in academic clinics showed higher DMARD use and lower rates of prednisone monotherapy, suggesting academic FPs may have better specialist access and communication pathways,⁴² more resources and time for complex care coordination,⁴³ or different patient populations with varying health care access patterns.⁴⁴ Many FPs expressed hesitation regarding long-term prednisone or DMARD prescription due to misdiagnosis concerns, adverse effects, and potential symptom masking that might complicate rheumatologist assessment, which is consistent with research indicating that long-term corticosteroid prescribing remains substantial despite risks of masking poor disease control and significant adverse effects.⁴⁵

Implications for practice and policy

Our findings that some FPs were unaware of available consultation services (Specialist Link) and the 124-day median delay between prednisone initiation and DMARD therapy highlight the need to strengthen existing communication tools and develop systematic collaboration approaches accounting for practice constraints, which would be consistent with CRA guidelines.^{42,46}

Given patient reports of obtaining prednisone through alternative means and continuing use against medical advice, patient education regarding prednisone is essential to align with patient-centred care principles² and CRA and European guidelines on shared decision-making.¹⁵⁻¹⁷

Substantial treatment delays (median=124 days) underscore the need to reduce barriers to access rheumatologist care in a timely manner to minimize prolonged prednisone bridging therapy, supporting CRA guidelines for short-term, low-dose use during DMARD initiation or adjustment.¹⁷

The 66% continuation rate beyond guideline-recommended timeframes suggests that enhancing dissemination of CRA glucocorticoid guidance in primary care is necessary. Despite existing protocols,¹⁷ FPs encounter implementation barriers. Targeted knowledge translation strategies and practical tools, integrated within clinical pathways, could standardize prescribing while accommodating primary care realities.

Limitations

A key limitation of this study was attributing prednisone use specifically to RA management. Despite excluding short-term prescriptions (≤14 days), misattribution may persist among patients with multiple indications. Our data do not capture clinical decision-making nuances, medication dosages, adherence patterns, or differentiate between continuous versus intermittent use. It also lacks prescriber identification, constraining cross-setting

Table 3. Characteristics of patients dispensed prednisone and disease-modifying antirheumatic drugs: N=546.

TREATMENT CATEGORY*	PREDNISONE STOPPED WITHIN 1 YEAR OF DMARD INITIATION	PREDNISONE CONTINUED AFTER 1 YEAR OF DMARD INITIATION	DMARD ONLY	PREDNISONE ONLY	NEITHER DMARD NOR PREDNISONE
No. (%)	71 (13)	139 (25)	149 (27)	48 (9)	139 (25)
Female:male, n (% of treatment group ^{††})	54:17 (76:24)	101:28 (73:27)	108:41 (72:28)	34:24 (59:41)	89:50 (64:36)
Age, y, mean (SD)	60 (15)	65 (15)	61 (16)	59 (17)	58 (16)
Deprivation category, n (%) [§]					
• 1	31 (43)	45 (32)	56 (38)	12 (25)	43 (31)
• 2-3	31 (43)	59 (42)	62 (42)	7 (15)	58 (42)
• 4-5	0 (0)	24 (17)	19 (13)	5 (10)	31 (22)
RDCI, median (IQR)	2 (1-3)	2 (1-3)	1 (0-2)	2 (1-3)	1 (0-2)
Asthma and-or COPD	10 (14)	24 (17)	20 (13)	13 (27)	24 (17)
No. of visits, median (IQR)	51 (33-86)	45 (21-84)	41 (21-71)	44 (24-76)	41 (22-67)
Duration in primary care, y, mean (SD)	8 (4)	7 (5)	7 (4)	6 (4)	7 (4)
Academic clinic, n (%)	42 (59)	88 (63)	86 (56)	18 (38)	139 (47)

COPD—chronic obstructive pulmonary disease, DMARD—disease-modifying antirheumatic drugs, IQR—interquartile range, RDCI—Rheumatic Disease Comorbidity Index, SD—standard deviation.
 *Treatment categories reflect presence or absence of medications in the Pharmaceutical Information Network records over the entire study period.
[†]Statistical comparisons between treatment groups revealed no significant differences in demographic or clinical characteristics ($P > .05$ for all comparisons).
^{††}Numbers might not add up to 100% owing to missing data.
[§]Deprivation categories are based on material deprivation indices by postal code. People living in level 5 areas are likely to be the most disadvantaged in terms of access to income, education, employment, housing, and essential services.

prescribing pattern analysis. Elevated prednisone dispensation rates during 2008 to 2010 may be a sampling or data quality artifact. Patients receiving neither DMARD nor prednisone (25%) may represent those with well-controlled disease in remission, patients receiving treatments not captured in our dispensing database (such as hospital-administered biologics), those with contraindications to these medications, or potentially undertreated patients. Recruiting providers primarily from academic settings may limit transferability of qualitative findings, though many participating FPs practice in both academic and community settings with similar approaches to patient care. Ultimately, we cannot determine whether prolonged prednisone use reflected patient preference, clinical necessity for extra-articular manifestations, or systemic constraints.

Conclusion

Disparities and guideline implementation challenges persist in prednisone dispensation for RA management. Despite its value as bridging therapy, our data reveal prolonged use beyond initial symptom management, particularly among male patients. FPs face difficulties balancing immediate symptom relief with early DMARD initiation amid extended specialist wait times. Future research should evaluate interventions reducing these disparities, including supportive care models for primary providers managing RA during specialist referral periods. Research should also aim to develop guidelines recognizing the complexity of managing patients with conflicting indications for glucocorticoid therapy and examine communication patterns between primary care providers and specialists in these cases. Improving outcomes necessitates addressing both immediate clinical needs driving prednisone use and systemic barriers perpetuating reliance on this medication. This requires expanded rheumatology resources alongside innovative care delivery approaches to serve diverse populations and reduce access inequities.

Dr Anh N.Q. Pham is an epidemiologist and postdoctoral fellow in the Faculty of Health Sciences at Simon Fraser University in Burnaby, BC. **Dr Sharon D. Koehn** is a medical anthropologist, research consultant, and research associate at the University of Alberta in Edmonton with an adjunct appointment in the Department of Gerontology at Simon Fraser University. **Dr Neil Drummond** is an epidemiologist and Professor Emeritus in the Department of Family Medicine at the University of Alberta, with adjunct appointments in the Departments of Family Medicine and Community Health Sciences at the University of Calgary in Alberta. **Dr Scott Garrison** is a practising family physician and Professor in the Department of Family Medicine at the University of Alberta. **Dr Claire E.H. Barber** is Associate Professor of Medicine and Associate Vice Chair for Planetary Health in the Department of Medicine at the University of Calgary. **Dr Doug Klein** is a family physician and Professor in the Department of Family Medicine at the University of Alberta. **Dr Lisa Jasper** is a physiotherapist who coordinates the Certificate in Pain Management through the Faculty of Rehabilitation Medicine, conducts research, and teaches at the University of Alberta. **Dr C. Allyson Jones** is an epidemiologist, practising physiotherapist in primary care, and Professor in the Department of Physical Therapy at the University of Alberta.

Acknowledgment

The authors thank those with rheumatoid arthritis who shared their experiences. The authors acknowledge the use of data from Alberta Health Services, the Canadian Primary Care Sentinel Surveillance Network, and the Southern Alberta Primary Care Research Network. The results and conclusions are those of the authors and no official endorsement of the data providers is intended. This work was supported by the Arthritis Society of Canada (Strategic Operating Grant 20-0000000018) and a Mitacs Accelerate Postdoctoral Fellowship (Dr Anh N.Q. Pham).

Contributors

All authors contributed to conceptualizing and designing the study; to collecting, analyzing, and interpreting the data; and to preparing the manuscript for submission.

Competing interests

None declared

Correspondence

Dr Sharon D. Koehn; email skoehn@ualberta.ca

References

- Bombardier C, Hawker G, Mosher D. The impact of arthritis in Canada: today and over the next 30 years [Internet]. Arthritis Alliance of Canada; 2011 [cited 2024 Apr 23]. Available from: https://www.arthritisalliance.ca/images/PDF/eng/Initiatives/20111022_2200_impact_of_arthritis.pdf.
- Hazlewood GS, Loyola-Sanchez A, Bykerk V, Hull PM, et al. Patient and rheumatologist perspectives on tapering DMARDs in rheumatoid arthritis: a qualitative study. *Rheumatology (Oxford)*. 2022 Feb 2;61(2):606-16. doi: [10.1093/rheumatology/keab330](https://doi.org/10.1093/rheumatology/keab330). Erratum in: *Rheumatology (Oxford)*. 2021 Nov 3;60(11):5484. doi: [10.1093/rheumatology/keab482](https://doi.org/10.1093/rheumatology/keab482).
- Bergström M, Ahlstrand I, Thyberg I, Falkmer T, et al. 'Like the worst toothache you've had' - How people with rheumatoid arthritis describe and manage pain. *Scand J Occup Ther*. 2017 Nov;24(6):468-76. doi: [10.1080/11038128.2016.1272632](https://doi.org/10.1080/11038128.2016.1272632). Epub 2017 Jan 5.
- Carr ECJ, Ortiz MM, Patel JN, Barber CEH, et al. Models of Arthritis Care: A Systems-level Evaluation of Acceptability as a Dimension of Quality of Care. *J Rheumatol*. 2020 Sep 1;47(9):1431-9. doi: [10.3899/jrheum.190501](https://doi.org/10.3899/jrheum.190501). Epub 2019 Nov 15.
- Lindén C, Björklund A. Living with rheumatoid arthritis and experiencing everyday life with TNF- α blockers. *Scand J Occup Ther*. 2010 Dec;17(4):326-34. doi: [10.3109/11038120903480055](https://doi.org/10.3109/11038120903480055). Epub 2009 Dec 14.
- Baymler Lundberg AS, Esbensen BA, Jensen MB, Hauge EM, et al. Facilitators and barriers in diagnosing rheumatoid arthritis as described by general practitioners: a Danish study based on focus group interviews. *Scand J Prim Health Care*. 2021 Jun;39(2):222-9. doi: [10.1080/02813432.2021.1913925](https://doi.org/10.1080/02813432.2021.1913925). Epub 2021 Apr 27.
- Bernatsky S, Feldman D, De Civita M, Haggerty J, et al. Optimal care for rheumatoid arthritis: a focus group study. *Clin Rheumatol*. 2010 Jun;29(6):645-57. doi: [10.1007/s10067-010-1383-9](https://doi.org/10.1007/s10067-010-1383-9). Epub 2010 Feb 3.
- Bernatsky S, Feldman D, Shrier I, Toupin K, et al. Care pathways in early rheumatoid arthritis. *Can Fam Physician*. 2006 Nov;52(11):1444-5.
- Stack RJ, Llewellyn Z, Deighton C, Kiely P, et al. General practitioners' perspectives on campaigns to promote rapid help-seeking behaviour at the onset of rheumatoid arthritis. *Scand J Prim Health Care*. 2014 Mar;32(1):37-43. doi: [10.3109/02813432.2014.900239](https://doi.org/10.3109/02813432.2014.900239).
- Oliver S, Bosworth A, Airoldi M, Bunyan H, et al. Exploring the healthcare journey of patients with rheumatoid arthritis: a mapping project - implications for practice. *Musculoskeletal Care*. 2008 Dec;6(4):247-66. doi: [10.1002/msc.139](https://doi.org/10.1002/msc.139).
- Widdifield J, Bernatsky S, Thorne JC, Bombardier C, et al. Wait times to rheumatology care for patients with rheumatic diseases: a data linkage study of primary care electronic medical records and administrative data. *CMAJ Open*. 2016 May 11;4(2):e205-12. doi: [10.9778/cmajo.20150116](https://doi.org/10.9778/cmajo.20150116).
- Chilton F, Bradley E, Mitchell T. 'Lost time': Patients with early inflammatory/rheumatoid arthritis and their experiences of delays in Primary Care. *Musculoskeletal Care*. 2021 Dec;19(4):495-503. doi: [10.1002/msc.1546](https://doi.org/10.1002/msc.1546). Epub 2021 Mar 15.
- Fair BS. Contrasts in patients' and providers' explanations of rheumatoid arthritis. *J Nurs Scholarsh*. 2003;35(4):339-44. doi: [10.1111/j.1547-5069.2003.00339.x](https://doi.org/10.1111/j.1547-5069.2003.00339.x).
- Hewlett S, Sanderson T, May J, Alten R, et al. 'I'm hurting, I want to kill myself': rheumatoid arthritis flare is more than a high joint count—an international patient perspective on flare where medical help is sought. *Rheumatology (Oxford)*. 2012 Jan;51(1):69-76. doi: [10.1093/rheumatology/keq455](https://doi.org/10.1093/rheumatology/keq455). Epub 2011 May 12.
- Nikolic RPA, Pardo JP, Pope JE, Barber CEH, et al. Canadian Rheumatology Association Living Guidelines for Rheumatoid Arthritis: Update #2. *J Rheumatol*. 2024 Sep 1;51(9):940-1. doi: [10.3899/jrheum.2024-0540](https://doi.org/10.3899/jrheum.2024-0540).
- Smolen JS, Landewé RBM, Bergstra SA, Kerschbaumer A. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2022 update. *Ann Rheum Dis*. 2023 Jan;82(1):3-18. doi: [10.1136/ard-2022-223356](https://doi.org/10.1136/ard-2022-223356). Epub 2022 Nov 10. Erratum in: *Ann Rheum Dis*. 2023 Mar;82(3):e76. doi: [10.1136/ard-2022-223356corr1](https://doi.org/10.1136/ard-2022-223356corr1).
- Hazlewood GS, Pardo JP, Barnabe C, Schieir O, et al. Canadian Rheumatology Association Living Guidelines for the Pharmacological Management of Rheumatoid Arthritis With Disease-Modifying Antirheumatic Drugs. *J Rheumatol*. 2022 Oct;49(10):1092-9. doi: [10.3899/jrheum.220209](https://doi.org/10.3899/jrheum.220209). Epub 2022 Jul 15.
- Medline Plus. Prednisone [Internet]. National Library of Medicine; 2020 [cited 2025 Jan 6]. Available from: <https://medlineplus.gov/druginfo/meds/a601102.html>.
- Pluye P, Hong QN. Combining the power of stories and the power of numbers: mixed methods research and mixed studies reviews. *Annu Rev Public Health*. 2014;35:29-45. doi: [10.1146/annurev-publhealth-032013-182440](https://doi.org/10.1146/annurev-publhealth-032013-182440). Epub 2013 Oct 30.
- Guest G, Bunce A, Johnson L. How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. *Field Methods*. 2006;18(1):59-82. doi: [10.1177/1525822X05279903](https://doi.org/10.1177/1525822X05279903).
- Dixon-Woods M, Cavers D, Agarwal S, Annandale E, et al. Conducting a critical interpretive synthesis of the literature on access to healthcare by vulnerable groups. *BMC Med Res Methodol*. 2006 Jul 26;6:35. doi: [10.1186/1471-2288-6-35](https://doi.org/10.1186/1471-2288-6-35).
- QSR International Pty Ltd. NVivo (Version 14) [Internet]. QSR International Pty Ltd; 2023 [cited 2025 Apr 15]. Available from: <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>.

23. Fereday J, Muir-Cochrane E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *Int J Qual Methods*. 2006 Mar;5(1):80-92. doi: [10.1177/160940690600500107](https://doi.org/10.1177/160940690600500107).
24. Pham ANQ, Barber CEH, Drummond N, Jasper L, et al. Development and validation of a rheumatoid arthritis case definition: a machine learning approach using data from primary care electronic medical records. *BMC Med Inform Decis Mak*. 2024 Nov 27;24(1):360. doi: [10.1186/s12911-024-02776-w](https://doi.org/10.1186/s12911-024-02776-w).
25. StataCorp LLC. Stata Statistical Software: release 14. StataCorp LLC; 2015 [cited 2026 Jan 12]. Available from: <https://www.stata.com/stata14/>.
26. Dougados M, Soubrier M, Antunez A, Balint P, et al. Prevalence of comorbidities in rheumatoid arthritis and evaluation of their monitoring: results of an international, cross-sectional study (COMORA). *Ann Rheum Dis*. 2014 Jan;73(1):62-8. doi: [10.1136/annrheumdis-2013-204223](https://doi.org/10.1136/annrheumdis-2013-204223). Epub 2013 Oct 4.
27. Roubille C, Coffy A, Rincheval N, Dougados M, et al. Ten-year analysis of the risk of severe outcomes related to low-dose glucocorticoids in early rheumatoid arthritis. *Rheumatology (Oxford)*. 2021 Aug 2;60(8):3738-46. doi: [10.1093/rheumatology/keaa850](https://doi.org/10.1093/rheumatology/keaa850).
28. Chester Wasko M, Dasgupta A, Ilse Sears G, Fries JF, et al. Prednisone Use and Risk of Mortality in Patients With Rheumatoid Arthritis: Moderation by Use of Disease-Modifying Antirheumatic Drugs. *Arthritis Care Res (Hoboken)*. 2016 May;68(5):706-10. doi: [10.1002/acr.22722](https://doi.org/10.1002/acr.22722).
29. Del Rincón I, Battafarano DF, Restrepo JF, Erikson JM, et al. Glucocorticoid dose thresholds associated with all-cause and cardiovascular mortality in rheumatoid arthritis. *Arthritis Rheumatol*. 2014 Feb;66(2):264-72. doi: [10.1002/art.38210](https://doi.org/10.1002/art.38210).
30. Aviña-Zubieta JA, Abrahamowicz M, De Vera MA, Choi HK, et al. Immediate and past cumulative effects of oral glucocorticoids on the risk of acute myocardial infarction in rheumatoid arthritis: a population-based study. *Rheumatology (Oxford)*. 2013 Jan;52(1):68-75. doi: [10.1093/rheumatology/kes353](https://doi.org/10.1093/rheumatology/kes353). Epub 2012 Nov 28.
31. Coburn BW, Baker JF, Hsu JY, Wu Q, et al. Association of Cardiovascular Outcomes With Low-Dose Glucocorticoid Prescription in Patients With Rheumatoid Arthritis. *Arthritis Rheumatol*. 2024 Nov;76(11):1585-93. doi: [10.1002/art.42928](https://doi.org/10.1002/art.42928). Epub 2024 Jul 23.
32. Barber CEH, Lethebe BC, Szostakiwskyj JH, Barnabe C, et al. A population-based analysis of rheumatology care patterns for inflammatory arthritis during COVID-19 in Alberta, Canada. *Semin Arthritis Rheum*. 2024 Apr;65:152364. doi: [10.1016/j.semarthrit.2024.152364](https://doi.org/10.1016/j.semarthrit.2024.152364). Epub 2024 Jan 11.
33. Loyola-Sanchez A, Hazlewood G, Crowshoe L, Linkert T, et al. Qualitative Study of Treatment Preferences for Rheumatoid Arthritis and Pharmacotherapy Acceptance: Indigenous Patient Perspectives. *Arthritis Care Res (Hoboken)*. 2020 Apr;72(4):544-52. doi: [10.1002/acr.23869](https://doi.org/10.1002/acr.23869).
34. Kobue B, Moch S, Watermeyer J. "It's so hard taking pills when you don't know what they're for": a qualitative study of patients' medicine taking behaviours and conceptualisation of medicines in the context of rheumatoid arthritis. *BMC Health Serv Res*. 2017 Apr 26;17(1):303. doi: [10.1186/s12913-017-2246-8](https://doi.org/10.1186/s12913-017-2246-8).
35. Lopatina E, Miller JL, Teare SR, Marlett NJ, et al. The voice of patients in system redesign: A case study of redesigning a centralized system for intake of referrals from primary care to rheumatologists for patients with suspected rheumatoid arthritis. *Health Expect*. 2019 Jun;22(3):348-63. doi: [10.1111/hex.12855](https://doi.org/10.1111/hex.12855). Epub 2018 Dec 5.
36. Wallace BJ, Lin P, Kamdar N, Noureldin M, et al. Patterns of glucocorticoid prescribing and provider-level variation in a commercially insured incident rheumatoid arthritis population: A retrospective cohort study. *Semin Arthritis Rheum*. 2020 Apr;50(2):228-36. doi: [10.1016/j.semarthrit.2019.09.002](https://doi.org/10.1016/j.semarthrit.2019.09.002). Epub 2019 Sep 7.
37. Flurey CA, Hewlett S, Rodham K, White A, et al. "You Obviously Just Have to Put on a Brave Face": A Qualitative Study of the Experiences and Coping Styles of Men With Rheumatoid Arthritis. *Arthritis Care Res (Hoboken)*. 2017 Mar;69(3):330-7. doi: [10.1002/acr.22951](https://doi.org/10.1002/acr.22951).
38. Koehn S, Jones CA, Barber C, Jasper L, et al. Candidacy 2.0 (CC) - an enhanced theory of access to healthcare for chronic conditions: lessons from a critical interpretive synthesis on access to rheumatoid arthritis care. *BMC Health Serv Res*. 2024 Aug 26;24(1):986. doi: [10.1186/s12913-024-11438-6](https://doi.org/10.1186/s12913-024-11438-6).
39. Shaw M, Collins BF, Ho LA, Raghu G. Rheumatoid arthritis-associated lung disease. *Eur Respir Rev*. 2015 Mar;24(135):1-16. doi: [10.1183/09059180.00008014](https://doi.org/10.1183/09059180.00008014).
40. American College of Rheumatology. Interstitial Lung Disease Guideline [Internet]. American College of Rheumatology; 2025 [cited 2025 Jan 27]. Available from: <https://rheumatology.org/interstitial-lung-disease-guideline>.
41. Kaplan A, Babineau A, Hauptman R, Levitz S, et al. Breaking down barriers to COPD management in primary care: applying the updated 2023 Canadian Thoracic Society guideline for pharmacotherapy. *Front Med (Lausanne)*. 2024 Aug 6;11:1416163. doi: [10.3389/fmed.2024.1416163](https://doi.org/10.3389/fmed.2024.1416163).
42. Miteva D, Bakopoulou K, Padjen I, El Kaouri I, et al. Integrating Primary Care and Specialized Therapies in Rheumatoid Arthritis: Optimizing Recognition, Management, and Referral Practices. *Rheumato*. 2025 Mar;5(1):3. doi: [10.3390/rheumato5010003](https://doi.org/10.3390/rheumato5010003).
43. Epstein JA, Wu AW. Delivering Complex Care: Designing for Patients and Physicians. *J Gen Intern Med*. 2021 Mar;36(3):772-4. doi: [10.1007/s11606-020-06212-3](https://doi.org/10.1007/s11606-020-06212-3). Epub 2020 Sep 15.
44. Loeb DF, Bayliss EA, Candrian C, deGruy FV, et al. Primary care providers' experiences caring for complex patients in primary care: a qualitative study. *BMC Fam Pract*. 2016 Mar 22;17:34. doi: [10.1186/s12875-016-0433-z](https://doi.org/10.1186/s12875-016-0433-z).
45. Crossfield SSR, Buch MH, Baxter P, Kingsbury SR, et al. Changes in the pharmacological management of rheumatoid arthritis over two decades. *Rheumatology (Oxford)*. 2021 Sep 1;60(9):4141-51. doi: [10.1093/rheumatology/keaa892](https://doi.org/10.1093/rheumatology/keaa892).
46. Hazlewood GS, Akhavan P, Pardo JP, Agarwal A, et al. Canadian Rheumatology Association Living Guidelines for Rheumatoid Arthritis: Update #1. *J Rheumatol*. 2023 Sep;50(9):1198-9. doi: [10.3899/jrheum.2023-0625](https://doi.org/10.3899/jrheum.2023-0625). Epub 2023 Aug 1.

This article has been peer reviewed.

Can Fam Physician. 2026 Mar;72(3):185-93.

doi: [10.46747/cfp.7203185](https://doi.org/10.46747/cfp.7203185)