

TITLE: CMA Rheumatology Wait Time Benchmarks: The need to tame the queue across the continuum of care

Authors:

Jessica Widdifield^{1,2*}; Sasha Bernatsky^{2,3}, J Carter Thorne⁴, Claire Bombardier⁵, R. Liisa Jaakkimainen^{1,5}, Laura Wing¹, J. Michael Paterson^{1,6}, Noah Ivers^{1,7}, Debra Butt^{5,8}, Anne Lyddiatt⁹, Catherine Hofstetter¹⁰, Vandana Ahluwalia¹¹, and Karen Tu^{1,5}

Affiliations:

¹ Institute for Clinical Evaluative Sciences, Toronto, Ontario, Canada

² McGill University Health Centre, Montreal, Quebec, Canada

³ McGill University, Montreal, Quebec, Canada

⁴ Southlake Regional Health Centre, Newmarket, Ontario, Canada

⁵ University of Toronto, Toronto, Ontario, Canada

⁶ McMaster University, Hamilton, Ontario, Canada

⁷ Women's College Hospital, Toronto, Ontario, Canada

⁸ Scarborough Hospital, Toronto, Ontario, Canada

⁹ Ingersoll, Ontario, Canada

¹⁰ Toronto, Ontario, Canada

¹¹ William Osler Health Centre, Brampton, Ontario Canada

***Correspondence:**

Jessica Widdifield Jessica.widdifield@utoronto.ca

Institute for Clinical Evaluative Sciences - Central

G1-11, 2075 Bayview Avenue, Toronto, Ontario M4N 3M5

Contributors:

JW, LW, KT, LJ had full access to all data in the study and guarantees the integrity of the data and accuracy of the analyses. JW drafted the manuscript. All authors revised the manuscript critically for important intellectual content. All authors have contributed substantially to the design, analysis and interpretation, have approved the final version submitted for publication, and agreed to act as guarantor of the work.

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ABSTRACT

Background: The Canadian Medical Association's Wait Times Alliance recently established wait time benchmarks for rheumatology consultations. Our aim was to quantify wait times to rheumatologist consultation, overall and for different diagnostic categories.

Methods: We identified patients with referrals to Ontario rheumatologists in the Electronic Medical Record Administrative data Linked Database (EMRALD). To assess the full patient care pathway, dates of symptom onset, presentation in primary care, and referral were identified from the primary care electronic medical records (EMRs). Dates of rheumatologist consultations were obtained by linking with physician service claims. The duration of each phase of the care pathway (symptom onset to primary care to referral to rheumatologist consultation) was determined and compared with established benchmarks.

Results: Among 2430 referrals from 168 family physicians, 83% of patients were seen by 146 rheumatologists. The main reasons for referral were arthritis (32%) and systemic inflammatory rheumatic diseases (31%). Wait times varied by condition and region. Overall, the median time from referral to rheumatologist consultation was 74 days; 66 days for systemic inflammatory rheumatic diseases. Wait time benchmarks were not achieved, even for the most urgent types of referrals. For systemic inflammatory rheumatic diseases, most of the delays occurred prior to referral.

Interpretation: Rheumatology wait times exceeded established benchmarks. Targeted efforts are needed to promote more timely access to both primary care and rheumatology care. Routine linkage of EMR with administrative data may help fill important gaps in knowledge about waits to primary and specialty care.

INTRODUCTION

Timely access to primary care and specialists is a nation-wide concern. The Canadian Medical Association's (CMA) Wait Times Alliance has mobilized efforts to reduce the excessive wait times that Canadians experience by establishing comparable indicators and evidence-based benchmarks for medically acceptable wait times(1, 2). Recent efforts have called upon the need to address wait times to primary care(3) and non-surgical specialists(4). Unfortunately, there is no universal approach in Canada to systematically measure and monitor wait times from primary care referral to specialist consultation. Moreover, a truly patient-centered approach to wait times measurement must address the total wait faced by patients, including the time from symptom onset to see a primary care physician, the time for the primary care physician to request a referral, and then the wait to see a specialist.

Rheumatology wait time benchmarks have recently been established(4). Rheumatic diseases represent the second greatest cause of disability and the fourth greatest impact on the overall world population health (in terms of both death and disability)(5, 6). Given the growing burden and overall impact of rheumatic diseases (7-9), providing these patients with timely access to healthcare remains a pan-Canadian challenge that will only intensify over time.

Primary care physicians play an essential role in coordinating care with rheumatologists to effectively diagnose, manage and treat patients with rheumatic diseases. Optimal care for rheumatic diseases hinges on early access to rheumatologists but there are many hurdles that can impede optimal care, such as delays in patient presentation and physician referrals (10). Although evidence for the benefits of early detection and treatment for improving patient outcomes has been well demonstrated in inflammatory arthritis (11-24), benchmarks for other rheumatic diseases have not yet been established - Box 1(4).

Reports on rheumatology wait times have arisen primarily from urban centres that do not

reflect the geographic realities of Canada (25-27). Previous studies quantifying delays to rheumatology care have also predominately focused on rheumatoid arthritis (RA) patients from rheumatology clinics and thus restrict analyses to only a subset of rheumatology referrals and those who successfully accessed specialists (25, 28-30). In light of this evidence gap, and the lack of systemic measurements to inform wait times across the continuum of care for patients with rheumatic diseases, we employed a novel approach to linking primary care electronic medical records (EMRs) with administrative health data to quantify delays to rheumatology care – overall, and for different diagnostic categories – for each component of the care pathway.

Box 1. Wait time benchmarks

Recommended maximum wait time from referral to rheumatologist consultation(4, 31)

Rheumatoid arthritis ; other inflammatory arthritis	FOUR WEEKS
Psoriatic arthritis	SIX WEEKS
Spondyloarthritis	THREE MONTHS
Systemic lupus erythematosus	FOUR WEEKS

METHODS

Study Design. We conducted an observational study involving EMRs from primary care physicians (to provide accurate dates of when referrals were requested) linked with health administrative data (to provide accurate dates of encounters with rheumatologists).

Data Sources. We used the Electronic Medical Record Administrative data Linked Database (EMRALD), comprised of electronic clinical practice data from primary care physicians throughout Ontario(32). Information includes patient and provider demographics and all electronic data captured during primary care visits, current and past medical histories, laboratory test results, prescriptions, referral letters, and diagnostic tests, as well as information related to care received elsewhere and reported to the practice.

EMRALD participants are also linked to the following administrative datasets. The Ontario Health Insurance Plan (OHIP) Corporate Provider Database (CPDB) is used to determine

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3 physician demographics, training and practice location, defined using the Ontario Medical
4 Association's Rurality Index of Ontario(33). Physician group affiliations were identified in the
5 Client Agency Program Enrolment (CAPE) database of patient enrollments with primary care
6 groups.
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10 Patient demographics including age, sex, patient residence and regional health service planning
11 areas (Local Health Integration Networks, LHIN) were determined from the OHIP Registered
12 Persons Database (RPDB). Encounters with rheumatologists were identified using the OHIP
13 Claims History Database, with rheumatology specialty defined using the Institute for Clinical
14 Evaluative Sciences (ICES) Physician Database (IPDB).
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17 These datasets are linked using unique, encoded patient and physician identifiers and are
18 securely held and analyzed at ICES (www.ices.on.ca).
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21 **Participants.** At the time of the study, 168 primary care physicians were included from across
22 Ontario. From 268,854 patients with valid health insurance numbers, we identified 2,925 patients
23 who had at least one electronic referral letter to a rheumatologist within the EMR from 2000 to
24 2013. Administrative data were obtained for these patients up until October 31, 2014. In an effort
25 to study first time referrals to rheumatology, we excluded patients with 're-referrals' (occurring
26 if the first referral occurred before the EMR start date), second opinions, miscoded rheumatology
27 referral letters, or missing or invalid referral dates.
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30 **Data abstraction.** Using a standardized data abstraction tool, the entire patient EMR was
31 reviewed to categorize each patient according to their diagnosis or clinical impression, identify
32 dates of symptom onset and the first encounter to the primary care physician related to the
33 complaint. Patients were categorized into five diagnostic categories: mechanical/degenerative
34 arthritis (e.g., osteoarthritis, OA), systemic inflammatory rheumatic diseases, regional
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3 musculoskeletal syndromes (e.g., tendonitis), chronic pain conditions (e.g., fibromyalgia),
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5 osteoporosis/osteopenia, and other (e.g., abnormal tests). Systemic inflammatory rheumatic
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8 diseases were further categorized into mutually exclusive categories: rheumatoid arthritis (RA),
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10 other inflammatory arthritis (e.g., seronegative, undifferentiated, palindromic rheumatism), gout
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12 and other crystal arthropathies (e.g., pseudo-gout, calcium pyrophosphate deposition), psoriatic
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14 arthritis, other spondyloarthropathies (e.g., ankylosing spondylitis, reactive, enteropathic),
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16 polymyalgia rheumatica, vasculitis, and other systemic autoimmune rheumatic diseases (e.g.,
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18 systemic lupus, scleroderma, Sjogren's, dermatomyositis, Raynaud's). When multiple
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20 conditions co-existed, the patient was assigned to the most serious complaint requiring
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22 consultation (e.g., a patient with pre-existing OA and acute onset inflammatory arthritis was
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24 categorized into the latter category). When there was discordance between physicians, the
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26 diagnosis was categorized according to the rheumatologist's impression (based on rheumatology
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28 consultation letters received post-referral).
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34 **Analysis.** To determine generalizability of our results, we assessed the characteristics of
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36 EMRALD study physicians in comparison to all Ontario primary care physicians. Descriptive
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38 statistics were used to characterize the study population according to reason for referral. The wait
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40 time was determined overall and for each diagnostic category for each component of the care
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42 pathway: 1) symptom onset until the date of the first primary care visit related to the complaint;
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44 2) first primary care visit related to the complaint until the date of referral to a rheumatologist;
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46 and 3) date the referral was sent to the date of the first rheumatologist visit. Patients were
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48 followed for at least 365 days from the date of the referral to identify the date of the first
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50 rheumatologist visit subsequent to the referral date recorded in the EMR. Wait times were
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52 compared with the established target wait times to determine the percentage of patients seen by a
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3 rheumatologist within each time frame. Actual wait-times (in days), including medians
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5 (interquartile ranges, IQR), means (standard deviations, SD), and 50th and 90th percentiles were
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7 estimated. Wait times from symptom onset were estimated for patients with systemic
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9 inflammatory conditions for whom symptom onset dates could be determined. Regional wait
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11 times according to the patient's residence were also evaluated.
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15 Analyses were performed on coded data using SAS version 9.2 and Microsoft SQL
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17 Server 2012. Ethics approval was obtained from the institutional review board at Sunnybrook
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19 Health Sciences Centre in Toronto, Ontario.
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22 23 24 **RESULTS**

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26 EMERALD physicians (representing 32 rural, 39 suburban, and 97 urban practices) were
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28 slightly younger, with more females and rural representation, in comparison to all Ontario
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30 primary care physicians (Table 1).
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34 After screening 2925 patients to identify first time referrals, 2430 (83%) patients were
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36 retained for analyses (Figure 1). Overall, 2417 (99.5%) referrals occurred between 2005 and
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38 2013 corresponding to the average duration of EMR use.
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42 Among 2430 patients referred to rheumatologists, 69% were female and the mean (SD)
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44 age at time of referral was 53 (16) years (Table 2). The most frequent referrals included
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46 mechanical/degenerative arthritis (N=787; 32%) and systemic inflammatory rheumatic diseases
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48 (N=745; 31%). The breakdown of systemic inflammatory rheumatic diseases were RA (16%),
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50 other inflammatory arthritis (22%), other systemic autoimmune rheumatic diseases (18%),
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52 crystal arthropathies (16%), spondylitis/spondyloarthropathies (10%), psoriatic arthritis (6%),
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54 polymyalgia rheumatica (9%), and vasculitis (3%), Table 2, Figure 1.
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3 In total, 68 (3%) patients had documentation of declining or missing the initial
4 rheumatology consultation after the referral letter was sent (Table 3). Of these 68 patients, 35%
5 subsequently saw a rheumatologist. Similarly, 87 (4%) referrals were declined by the first
6 rheumatologist approached to assess the patient. The majority of declined referrals were for non-
7 systemic inflammatory conditions. The most common reason for refusal was that the
8 rheumatologist only assessed patients with certain conditions (Table 3). Of these 87 patients,
9 59% subsequently saw another rheumatologist.
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20 According to administrative data, 2015 (83%) patients were seen by 146 distinct
21 rheumatologists within 365 days of referral, and 58% of patients were seen within three months
22 of referral. Wait times varied by condition (Table 4). The median (IQR) time from referral to
23 rheumatologist was 74 (27-101) days among all patients and 66 (18-84) days among patients
24 with systemic inflammatory rheumatic diseases.
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32 For systemic inflammatory rheumatic diseases, 33% were seen within four weeks of
33 referral (Table 4). Comparing to established CMA wait time benchmarks (target being 100%),
34 38% of RA patients were seen within four weeks of the date of referral (35% for other
35 inflammatory arthritis), 63% of spondyloarthritis patients were seen within three months; and
36 34% of psoriatic arthritis patients were seen within six weeks. For RA patients, the median time
37 to be seen by rheumatologists from symptom onset and date of referral was 327 and 66 days,
38 respectively (Table 4-5). Wait times from symptom onset to rheumatologist also varied amongst
39 different types of systemic inflammatory rheumatic diseases (Table 5). The total delay was
40 longest for patients with crystal arthropathies and spondylitis.
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54 Geographic variations in wait times were observed (Table 6). The longest wait times
55 consistently occurred in the South West LHIN and the Champlain LHIN, where median waits
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3 from referral to rheumatology consultation were 2-3 times those in the Central East LHIN.
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8 **Interpretation**

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10 Using EMRs from a representative sample of primary care practices revealed exceedingly
11 long wait times to see rheumatologists. Established wait time benchmarks were not achieved for
12 even the most urgent types of referrals (i.e. inflammatory arthritis including RA). Close to one in
13 three referrals were for systemic inflammatory conditions and these were seen earlier compared
14 to other types of referrals. However, most of the delay for these urgent conditions occurred prior
15 to referral, representing delays in patients seeking medical attention and family doctors waiting
16 too long to refer patients who require earlier access.
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27 Previous Canadian reports among RA patients seen in urban settings estimated shorter
28 wait times than our study: three to six months wait from symptom onset to referral and then
29 approximately one month from referral to see a rheumatologist(25-27, 29, 30). Our findings
30 confirm that wait times in certain urban areas, such as Toronto, are shorter than elsewhere in the
31 province. There is also ample evidence from international studies that support our findings that
32 the majority of the delay occurs prior to referral (34-38). This suggests delays attributed to the
33 awareness and care-seeking behavior of patients, as well as opportunities to improve screening in
34 primary care.
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46 | Wait time measurement plays an important part in driving quality improvement and
47 accountability. The CMA economic wait times report identified the wait time costs for joint
48 replacement surgery to be significantly higher than for other priority areas(39). Yet, the costs of
49 the ‘excess wait’ ignored the total costs endured by patients in getting to see the specialist or
50 even in getting to see their family doctor. As the decision-making and timing for orthopedic
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3 surgery is often established by an interdisciplinary team of rheumatologists and orthopedic
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5 surgeons, our findings contribute novel data on the excessive wait times patients endure across
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7 the entire patient care pathway. Reducing wait times to rheumatologists for appropriate care
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9 management may ultimately reduce the need for joint replacement surgery (40, 41).
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13 In Canada, both rheumatologists and primary care physicians identify long wait times as
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15 a barrier to providing adequate care (42-44), and waits to see rheumatologists are longer than for
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17 most other medical subspecialties(45). We believe our findings represent a call to action on the
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19 need for increasing awareness amongst patients, physicians and policy-makers of the major
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21 burden that rheumatic diseases places on individuals, society and healthcare systems and to
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23 prioritize planning of healthcare services, medical education (46, 47), and research (9). The
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25 relative shortage of rheumatologists(48-50) especially in rural areas and the projected increasing
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27 burden of rheumatic diseases(5, 8) suggests a need for innovative models of care(51, 52).
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29 Rheumatology referrals are often not done in a standardized or consistent way and wait times
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31 vary by individual rheumatologist. Primary care physicians may refer patients to the
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33 rheumatologist they know the best,(53) unaware of the shorter wait times of other
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35 rheumatologists. This suggests a need for better ways to systematically track and report waits at
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37 the level of specialists. Finally, given the substantial delay in patients seeking medical attention
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39 and the delay of primary care physicians requesting referrals, increasing patient awareness and
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41 medical education are acutely needed.
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49 While our study is the largest and most detailed to document the experience of Canadians
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51 with rheumatic diseases waiting to access primary and rheumatology care, several limitations
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53 warrant discussion. The retrospective nature of the data meant that we were reliant upon accurate
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55 clinical documentation. This raises the possibility of misclassification between diagnostic
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3 categories. Since patients with more classic disease presentation or more active disease may be
4 more correctly diagnosed, and wait times may be different for such patients, such
5 misclassification could introduce bias. Furthermore, dates of symptom onset may be inaccurately
6 documented, and we were unable to estimate symptom onset for chronic complaints. However,
7 dates of symptom onset for systemic inflammatory conditions with acute onset are less likely to
8 be affected by recall bias. Finally, wait times are likely to differ across provinces. Our regional
9 variations within province did not appear to correlate well with regional rheumatology supply
10 (Table 6) as patients may seek care outside of their health-planning region or there may be
11 different thresholds for referral by region. For example, the delay from symptom onset to
12 rheumatologist was much longer for RA in the North East (data not shown) yet the wait from
13 referral to rheumatologist was shorter compared to other regions, which may reflect referrals
14 being requested when physicians are aware of locum rheumatologists visiting the area. Despite
15 these limitations, we present a unique approach to monitoring wait times for specialist care in the
16 absence of a national wait time reporting system.

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In conclusion, wait times to rheumatologists exceeded established benchmarks and improving access is urgently required. For systemic inflammatory rheumatic diseases, most of the delay occurs prior to referral, where targeted efforts are needed to promote more timely consultations. As Canadian administrative data currently cannot be used to monitor wait times to specialists, approaches to linking EMR and administrative data are worth exploring.

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Conflict of interest

The authors declare there are no conflicts of interest related to this study.

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Confidential

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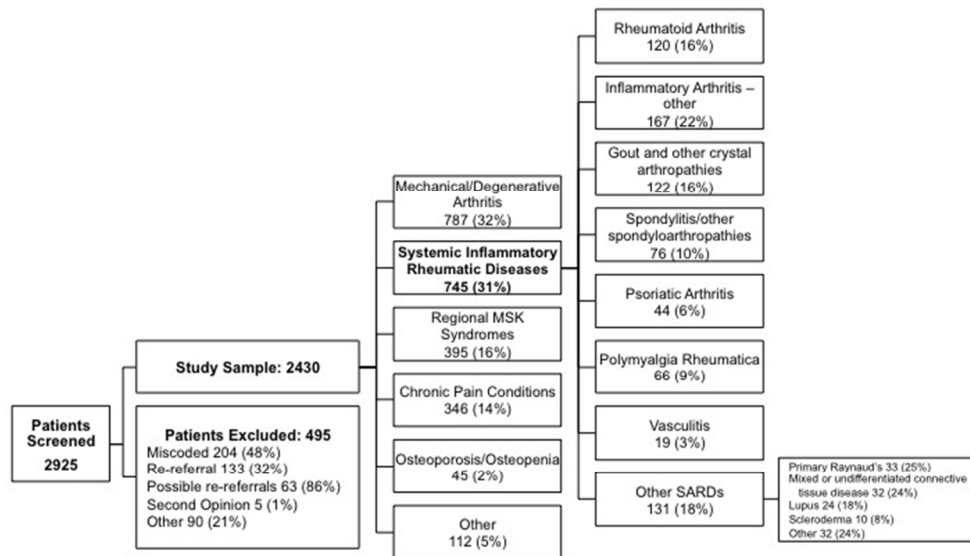
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Table 1. Comparison of EMERALD study physicians and all primary care physicians in Ontario as of March 31, 2014

Characteristic	EMERALD Physicians N=168		All Primary Care Physicians in Ontario ¹ N=8054	
	N	%	N	%
Sex				
Female	94	56.0	3333	41.4
Male	74	44.0	4721	58.7
Age group				
Under 35 years	25	14.9	500	6.2
35-44 years	57	33.9	1643	20.4
45-54 years	36	21.4	2425	30.1
55-79 years	46	27.4	3471	43.1
Unknown	4	2.4	15	0.2
Medical training location				
Canada	150	89.3	5967	74.1
International	17	10.1	2074	25.8
Unknown	1	0.6	13	0.2
Practice Location				
Rural	32	19.1	631	7.6
Suburban	39	23.2	1355	16.3
Urban	97	57.7	6325	76.1
Group Model²				
FHG or FHN	18	10.7	2795	34.7
FHO	136	81.0	3525	43.8
Other/Unknown	14	8.3	1734	21.5
	Mean	Range	Mean	Range
Physician Age	46.6	28-69	52.2	27-79
Years in practice	15.2	1-36	18.5	0-45
Years since graduation	19.9	3-43	26.3	2-65

¹ Primary care physicians were defined as having a main specialty of general physician/family physician or Community Medicine/Public Health who's practice is focused on primary care;
² Abbreviations: Family Health Groups (FHG); Family Health Networks (FHN); Family Health Organizations (FHO)



Study flow diagram of sample selection and classification of referrals
 254x142mm (72 x 72 DPI)

Table 2. Patient Characteristics at time of referral

	No. of Patients	Age, Mean (SD)	Female, n (%)
All Patients	2430	53.0 (16.3)	1682 (69.2)
Arthritis	787	56.4 (15.6)	554 (70.4)
Systemic Inflammatory Rheumatic Diseases	745	53.4 (17.0)	427 (57.3)
Rheumatoid Arthritis	120	55.4 (15.8)	84 (70.0)
Inflammatory Arthritis – other	167	50.9 (16.2)	95 (56.9)
Crystal Arthropathy	122	61.3 (15.3)	33 (27.0)
Spondylitis/Spondyloarthropathy	76	41.5 (15.2)	31 (40.8)
Psoriatic Arthritis	44	52.9 (12.6)	26 (59.1)
Polymyalgia Rheumatica	66	71.2 (9.2)	41 (62.1)
Vasculitis	19	52.7 (23.5)	10 (52.6)
Other systemic autoimmune rheumatic diseases	131	45.3 (13.9)	107 (81.7)
Regional Musculoskeletal (MSK) Syndromes	395	52.2 (15.8)	286 (72.4)
Chronic Pain Conditions	346	46.5 (14.3)	298 (86.1)
Osteoporosis	45	62.3 (15.2)	38 (84.4)
Other	112	46.3 (16.3)	79 (70.5)

Table 3. Main Reasons for declined referrals

	All Patients ¹ n (%)
Patient declined or missed consultation after first referral sent	68 (2.8)
Main Reasons:	
Symptoms resolved	6 (8.8)
Patient choice	21 (30.9)
Patient unavailable/missed appointment	26 (38.2)
Rheumatologist declined consultation after first referral sent	87 (3.4)
Main Reasons:	
Only consults for certain conditions	23 (26.4)
Rheumatologist suggested an alternate plan (e.g. pain clinic, another specialist)	21 (24.1)
No reason provided	19 (21.8)
Not accepting new patients	10 (11.5)
¹ N=2430	

Confidential

Table 4. Wait time from date of referral to rheumatologist consultation (*Benchmarks Targets=100%)

	No. of Patients	Proportion of Patients seen by a rheumatologist within						Wait time (days)		Percentile ¹ (days)	
		4 Weeks	6 Weeks	3 Months	6 Months	9 Months	12 Months	Mean (SD)	Median (IQR)	50 th	90 th
All Patients	2430	23.8	34.8	58.2	75.7	80.8	82.9	76 (69)	74 (27-101)	57	170
Arthritis	787	21.4	31.6	57.7	76.4	81.3	84.0	80 (70)	73 (30-103)	62	174
Systemic Inflammatory Rheumatic Diseases	745	32.5	44.7	66.6	80.1	84.4	86.3	64 (66)	66 (18-84)	43	155
Rheumatoid Arthritis	120	38.3*	47.5	70.8	79.1	84.2	86.7	63 (71)	66 (15-81)	37	166
Inflammatory Arthritis: other	167	35.3*	50.9	70.1	79.6	83.2	85.6	59 (67)	55 (17-71)	38	128
Crystal Arthropathy	122	27.1	41.8	63.9	82.8	87.7	88.5	70 (61)	69 (24-93)	52	156
Spondylitis/ Spondyloarthropathy	76	22.4	31.6	63.2*	82.9	85.5	85.5	68 (50)	62 (29-91)	58	146
Psoriatic Arthritis	44	25.0	34.1*	59.1	86.4	95.5	97.7	85 (75)	88 (30-117)	56	189
Polymyalgia Rheumatica	66	47.0	54.6	71.2	81.8	86.4	87.8	52 (61)	53 (11-64)	27	131
Vasculitis	19	52.6	63.2	73.7	73.7	79.0	79.0	35 (51)	28 (11-39)	16	71
Other systemic rheumatic diseases	131	26.7	40.5	61.8	75.6	78.6	81.7	68 (72)	62 (22-83)	46	137
Regional MSK Syndromes	395	25.1	36.7	60.8	77.7	81.8	83.5	70 (64)	68 (26-94)	53	152
Chronic Pain Conditions	346	14.7	25.4	46.5	68.2	76.0	78.3	92 (75)	90 (35-125)	72	204
Osteoporosis	45	7.0	9.0	20.0	53.0	62.0	62.0	115 (62)	82 (74-156)	118	183
Other	112	14.0	24.0	48.0	66.0	71.0	73.0	86 (68)	69 (40-110)	69	175

¹The 50th percentile reflects that half of the patients have seen a rheumatologist within this time frame and half are still waiting; 90th percentile reflects that 90% of patients have seen a rheumatologist within this time frame and 10% are still waiting; *Benchmark Target = 100%

Table 5. Total delay from symptom onset to rheumatologist consultation for systemic inflammatory rheumatic diseases

	Rheumatoid Arthritis	Inflammatory Arthritis-other	Crystal Arthropathy	Spondylitis	Psoriatic Arthritis	Polymyalgia Rheumatica	Vasculitis	Other systemic rheumatic diseases
Median (IQR), days								
Symptom onset to primary care visit ¹	173 (16-189)	102 (10-112)	188 (4-192)	716 (14-730)	228 (17-245)	63 (14-77)	128 (3-131)	208 (14-222)
Primary care visit to referral ²	115 (14-128)	125 (11-136)	353 (20-373)	173 (7-181)	513 (15-528)	123 (15-138)	73 (7-80)	181 (7-188)
Symptom onset to Referral ²	326 (49-375)	259 (41-300)	1326 (48-1374)	1342 (63-1405)	627 (90-7167)	238 (55-293)	293 (33-325)	855 (44-899)
Referral to Rheumatologist ³	66 (15-81)	55 (17-71)	69 (24-93)	62 (29-91)	88 (30-117)	53 (11-64)	28 (11-39)	62 (22-83)
Symptom onset to Rheumatologist	327 (83-410)	260 (91-350)	1312 (111-1423)	1262 (112-1374)	680 (125-805)	240 (81-321)	608 (59-667)	940 (113-1053)
Proportion of Patients seen by rheumatologists within								
3 months from symptom onset	24%	21%	16%	14%	-	28%	28%	17%
6 months from symptom onset	42%	46%	35%	34%	34%	53%	39%	30%
9 months from symptom onset	50%	59%	45%	39%	43%	63%	44%	42%
12 months from symptom onset	59%	66%	47%	41%	49%	72%	56%	47%
¹ Defined as first documentation of the complaint within primary care medical record								
² Defined as the date the referral was sent out to the rheumatologist								
³ Defined as the first visit to the rheumatologist								

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Table 6. Median wait-time from referral to rheumatologist consultation according to patient’s health planning region (LHIN)

LHIN	LHIN NAME	N	%	Median (IQR)	No. of rheumatologists 2009/10	No. of rheumatologists per 100,000
1	Erie St Clair	<5	-	-	<5	0.7
2	South West	182	7.5	146.5 (34.3-180.8)	9	1.1
3	Waterloo Wellington	405	16.7	77.5 (28.0-105.5)	<5	0.5
4	Hamilton Niagara	67	2.8	71.2 (24.3-95.5)	19	1.6
5	Central West	90	3.7	103.0 (41.0-144.0)	5	0.8
6	Mississauga Halton	29	1.2	65.0 (17.0-82.0)	11	1.2
7	Toronto Central	509	20.9	59.0 (15.0-74.0)	50	5.2
8	Central	365	15.0	72.3 (27.0-99.3)	18	1.3
9	Central East	184	7.6	46.3 (32.0-78.3)	12	0.9
10	South East	13	0.5	125.2 (30.8-156.0)	6	1.4
11	Champlain	166	6.8	112.2 (49.8-162.0)	19	1.8
12	North Simcoe Muskoka	224	9.2	77.5 (25.5-103.0)	<5	0.8
13	North East	190	7.8	55.0 (37.0-92.0)	<5	0.2
14	North West	0	-	-	<5	1.0
	Unknown	5	0.2	31.5 (43.75-75.25)		
	All Ontario	2430		74.0 (27.0-101.0)	162	1.5