ARTHRITIS COMMUNITY RESEARCH & EVALUATION UNIT (ACREU)
University Health Network

2007 SURVEY OF RHEUMATOLOGISTS IN ONTARIO

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Table of Contents

Tables

Figures

Executive Summary

A survey of all rheumatologists in Ontario was carried out in 2007 by the Arthritis Community Research and Evaluation Unit (ACREU) to examine the current supply of rheumatology human resources, geographic location of delivery of services to patients by Local Health Integration Network (LHIN), amount of service delivered, reported waiting times for rheumatology services, characteristics and practice patterns of rheumatologists, care for patients with inflammatory arthritis, and availability of and referrals by rheumatologists to other services and programs. This survey updates a similar survey carried out by ACREU in 2000.

A total of 164 practicing rheumatologists were identified in Ontario in 2007: 152 responded to a two part questionnaire (response rate 93%). All of these answered Part 1 of the questionnaire on location of practice, clinic hours and waiting times. Seventy-four percent (n=111) also answered questions in Part 2 on practice patterns, rheumatology characteristics, care for patients with inflammatory arthritis, and availability of and referrals to other services, representing an overall response rate of 68% to Part 2.

The overall provincial per capita provision was 1.20 rheumatologists per 100,000 population equivalent to 1.00 full-time equivalent (FTE) per 100,000 population. Apart from the South East LHIN, the absolute number of rheumatologists tended to be higher in the LHINs with teaching hospitals (LHINs that have a university that offers medical training).

Twelve percent practiced in more than one LHIN with most cross-boundary flow between urban LHINs, primarily the Greater Toronto Area. The main exception was the North East, where traveling rheumatologists more than doubled the care for that LHIN.

The overall amount of direct clinical care provided by rheumatologists was 38.3 hours (9.6 half days) per week per 100,000 population. On average, rheumatologists in Ontario each provided 32 hours of direct clinical care per week with wide variation across LHINs. There was very little change in the amount of rheumatology provision across Ontario per 100,000 population between the 2007 and 2000 surveys of rheumatologists.

As expected, the mean waiting time reported by rheumatologists for likely inflammatory patients was lower than that for non-urgent referrals, 3.6 weeks versus 13.4 weeks respectively with the longest waiting times reported for northern Ontario.

The following summary points refer to the 63% of rheumatologists responding to Part 2 of the questionnaire:

Slightly more than one-third of respondents were female (37%). The mean age was 43 years and mean years in practice was 18. Almost one-third of rheumatologists planned to retire within ten years.

Adults comprised the majority of the patient population. Two fifths of rheumatologists reported a subspecialty, most frequently rheumatoid arthritis. Most rheumatologists had a hospital appointment, and over half had a faculty appointment. Clinical practice comprised the largest proportion of a rheumatologist's time. Rheumatologists in teaching LHINs spent significantly less time in clinical activities and significantly more time in research, teaching and administration compared with rheumatologists in non-teaching LHINs.

The proportion of rheumatologists reporting difficulties scheduling follow-up appointments was similar to 2000, with 57% in 2007 reporting such difficulties. The proportion of rheumatologists able to see urgent referrals within a week “all the time” decreased from 2000 (43%) to 2007 (33%). Two thirds of rheumatologists indicated that their practice volume was increasing, compared with three years ago, a continuing trend from the 2000 survey.

Rheumatologists were asked about barriers to practicing as they would like. The most frequently mentioned barrier was “financial barriers, such as affordability of drugs to patients”: this was also the case for the 2000 survey. “Billing policies and regulations for consultation and follow-up visits” were not as highly ranked as a barrier as in 2000, when it was the second highest reported barrier. In line with this a higher proportion of rheumatologists in 2007 (20%) than 2000 (7%) reported they could easily make ends meet from rheumatology practice alone.

Most rheumatologists saw patients with inflammatory arthritis. The majority of rheumatologists reported their inflammatory caseload had either remained the same or had increased. Approximately half of patients seen in the last month had inflammatory arthritis. The mean reported proportion of inflammatory arthritis patients referred within three months of symptom onset was 44%.

Combination disease modifying anti-rheumatic drugs continued to be the treatment of choice, with over two thirds of rheumatologists reporting that more than 50% of their patients received this therapy. Overall the use of biologics appeared to be increasing with 42% of rheumatologists in LHINs with teaching hospitals and 81% in LHINS without teaching hospitals reporting that biologic prescription had increased in the past year ($p=0.05$). One-quarter of rheumatologists in Ontario supervised an infusion clinic.

Forty-five percent reported that they were involved in new emerging models of care, most commonly early arthritis clinics and comprehensive team care/coordinated care programs.

Overall, reported availability of services (i.e., orthopaedic surgery, The Arthritis Society, non-pharmacological therapy) for patients to manage their arthritis was quite high. While most rheumatologists who reported services available made referrals to a range of services, the average percentage of patients being referred to specific services varied by service. Physiotherapy was the service with the highest reported percentage (35%) of patients referred. Perceived appropriateness of waiting times varied across services.

When compared to the 2000 data the lack of an increase in the amount of rheumatology service in 2007 as well as continued geographic maldistribution is problematic given the number of people with arthritis is increasing. However, changes in billing policies have had a positive effect on rheumatology practice and may influence potential trainees regarding rheumatology as a profitable specialty. A comprehensive solution that is rooted in evidence-based research is need to better understand how to increase the number of rheumatologists and how best to utilize available health human resources and to ensure timely and appropriate care for individuals with arthritis in Ontario wherever they may live.

1.0 Introduction

The projected burden of arthritis and related conditions expected to affect Canadians over the next decade is estimated at over six million people[1]. As arthritis is a chronic disease that typically lasts the duration of a person's life, adequate and appropriate care must be available throughout the course of an individual's life and at all stages of the disease. Specialist services such as rheumatology are part of a comprehensive approach to arthritis management, particularly for rheumatoid arthritis[2-4]. Access to rheumatology services and early treatment (within three months of symptom onset) for individuals with rheumatoid arthritis is important, as delays in therapy initiation may adversely affect disease activity, remission and functional capacity[5-11]. Continuing care from a rheumatologist is important, as lack of referral to a rheumatologist leads to progressively increasing functional disability in individuals with rheumatoid arthritis[12]. Although early referral has long been recommended, with the advent of biologics early referral is even more necessary today[13,14]. These findings highlight the value of rheumatology subspecialty care to achieve positive health outcomes in rheumatoid arthritis and underline the importance of minimizing waiting times.

Access to effective interventions for arthritis is often insufficient and widely variable across Ontario[15-18]. Earlier surveys of rheumatologists in Ontario completed in 1992[19,20], 1997 [15,18] and 2000[17,21] identified considerable variation in rheumatology services across Ontario. The 2000 survey collected data on the number of active practicing rheumatologists, service provision, geographic distribution, waiting times and barriers to practice[17,21]. There was no change in overall level of provision of rheumatology services since the 1997 survey. The results highlighted many barriers facing the rheumatology community: geographic variation in level of service provision in Ontario and waiting times, with areas with low provision having the longest wait [17,22]. In these earlier surveys it was identified that services tended to be clustered around medical teaching centres and larger communities[15,17]. In addition to rheumatology services, timely and appropriate access was also related to other factors. In the 2000 ACREU survey, barriers to provision of appropriate care were also identified, with the most common barrier being cost of drugs[15,17,22]. Restrictive access to expensive treatments, such as biologics, and to orthopaedic and allied professional services is also problematic [23].

Ensuring all Canadians with arthritis have future access to timely health care depends on continued investigation into the availability and efficiency of rheumatology services, as well as considerations of adequacy for the future. A variety of optimal provision rates have been suggested: 1 per 90,000 in the UK[24]; 1 per 100,000 in New Zealand[25]; 1 per 44,492 in the United States[26]; and 1.9 per 100,000 population in Canada [27]. While determination of the provision of rheumatologists has been a source of continued debate, it is generally agreed that whatever the optimal number may be, there are currently not enough practicing rheumatologists in Ontario, Canada, the United States and in many other jurisdictions[28-31].

As the population ages and the demand for rheumatology services continues to increase, while physician human resource shortages will ultimately limit the ability of Canadians to seek care[27], long waiting times[22,32], referral problems[33,34], and geographic misdistribution[17,35] will compound the problem further. Not only are individuals having difficulty accessing care[36], but younger rheumatologists are spending less time in patient care[22] and, as reported in the United States, are working shorter hours[37]. Rheumatology is among the most poorly compensated specialties[38]. In the United States, academic rheumatologists are said to be further challenged with being able to make a living given the uncompensated non-clinical activities they participate

in, such as teaching and administrative duties[38]. All these factors contribute to the growing problem that individuals have with accessing arthritis care[36].

This current rheumatology survey updated the results of the 2000 survey. An understanding of the current level of service provision by rheumatologists is critical to planning service delivery for an aging population. The *2007 Survey of Rheumatologists in Ontario* updated the information on human resource availability and workload collected in previous years, including information on the amount of clinic time, waiting times and practice patterns. In light of changes in the health care system since the last survey in 2000, the 2007 survey also examined current issues relevant to the rheumatology community.

2.0 Purpose and Objectives

As part of a program of research to document gaps and needs in existing health care services and health care providers for people with arthritis in Ontario, ACREU conducted the *2007 Survey of Rheumatologists in Ontario*. The purpose of the current research was to survey all rheumatologists practicing in Ontario to ascertain the current supply of rheumatology human resources, geographic location of delivery of services to patients, the amount of service delivered, waiting times for rheumatology services and practice patterns of rheumatologists.

Specifically, this research surveyed all rheumatologists practicing in Ontario to address the following:

- To identify geographic availability of rheumatology services by LHIN
- To examine workload of rheumatologists in Ontario
- To identify characteristics of rheumatologists in Ontario
- To examine reported rheumatology waiting times in Ontario
- To explore practice patterns of rheumatologists in Ontario
- To investigate care for patients with inflammatory arthritis
- To examine availability of and referrals by rheumatologists to services and programs
- To document time trends in provision and practice patterns where applicable, using data from ACREU's 1992, 1997 and 2000 Ontario Surveys of Rheumatologists

3.0 Methodology

3.1 Study design

All practicing rheumatologists in Ontario were invited to complete a self-administered questionnaire to examine geographic distribution, supply of rheumatologists, workload (office time) and practice patterns. In addition, internal medicine specialists with a subspecialty in rheumatology were also invited to participate.

Rheumatologists were identified through directory listings of the College of Physicians and Surgeons of Ontario 2006 annual survey database and website of the College of Physicians and Surgeons of Ontario; The Arthritis Society, Ontario Division; and, the Canadian Medical Directory. Internal medicine specialists that provide rheumatology services were identified through The Arthritis Society, Ontario Division, and the Canadian Medical Directory. Rheumatologists not practicing in Ontario, including those who were retired, on temporary

sabbatical leave, working in a research-only capacity, or who had moved out of the province were excluded. Postgraduate fellows were also excluded as they were still undergoing training.

All rheumatologists were sent 1) an information letter explaining the purpose of the study, signed by the principal investigator of the study and by a representative of the Ontario Rheumatology Association (Appendix A), and 2) a self-administered semi-structured survey questionnaire called *Ontario Survey of Rheumatologists (September 2007)*, which contained a series of questions to be answered and returned to the ACREU by fax or mail (Appendix B). Response to the questionnaire implied consent. Research ethics approval to conduct the study was received from the University Health Network, Toronto, Ontario. Participation was voluntary and respondents could refuse to participate at any time.

3.2 Questionnaire

The survey questionnaire was developed based on the 2000 Ontario Survey of Rheumatologists Questionnaire and with further input from rheumatologists (see Acknowledgements). The questionnaire had two parts: **Part 1,** which contained *Background Information* (Section A) and information on *Geographic Distribution* (Section B), and **Part 2**, which asked questions about *Practice Patterns* (Section C), *Care for Patients with Inflammatory Arthritis* (*Section* D), *Management of Patients in Your Office* (Section E), and *Your Practice as a Rheumatologist* (Section F). *Background Information* established whether a rheumatologist was active or inactive in practice in Ontario. The *Geographic Distribution* section included questions regarding number and the location of all the clinics held by the rheumatologist and average waiting time. As some rheumatologists practice in more than one LHIN, the questionnaire asked rheumatologists about the location of their practice and the time they spend on clinical practice in each of their practice locations to give a more accurate picture of the type and amount of provision. The *Practice Patterns* section included questions regarding patient population and changes in practice. *Care for Patients with Inflammatory Arthritis* asked specifically about the inflammatory arthritis patient population. *Management of Patients in Your Office* gathered information about referrals and specific services available to patients. *Your Practice as a Rheumatologist* asked questions about practice responsibilities and demographic information, such as years in practice and anticipated retirement date.

3.3 Data collection and management procedures

As it was necessary to achieve a response rate close to 100% for Part 1 of the questionnaire for estimates of supply to be accurate, an extensive reminder and follow-up system was implemented. A reminder letter (Appendix C) was sent two weeks subsequent to the initial mail-out with a self-addressed envelope, and telephone follow-up (Appendix D) for non-respondents commenced two weeks after the reminder letter was sent. When a questionnaire remained outstanding, telephone contact by a research associate was made with the rheumatologist's administrative staff to complete the questions in Part 1 of the questionnaire (Section A: *Background Information* and Section B: *Geographic Distribution*). Finally, an email reminder was sent to those rheumatologists who could not be contacted after multiple attempts by telephone (Appendix E).

Questionnaires were received by fax and mail and were dated when received. A few responses were received by email. A management database created in Microsoft Access tracked questionnaires received and was used to record other aspects related to status of potential respondents, including comments related to follow-up. Each questionnaire was reviewed, and

when a response was missing or unclear in Part 1 of the questionnaire, a research associate attempted to follow-up with the survey respondent or his/her administrative staff to clarify the information. After double data entry and verification, data were cleaned and exported to *SAS version 9.1* for analysis.

3.4 Data analysis

Practice data (for office/clinic time) were expressed in number of hours per week or office half days per week (a half day was equivalent to four hours). Practice patterns were analyzed for the province as a whole. LHIN locations were assigned based on postal code data provided by the rheumatologists, for each practice setting (See Appendix F for an Ontario map of LHIN names and boundaries). The provision of clinic services within each LHIN was calculated, taking into account rheumatologists who travel and provide service outside the LHIN of their main practice setting. The amount of service provided in each LHIN was expressed as amount of service per week per 100,000 population, using 2006 intercensal population estimates. At the time of analysis, 2007 population estimates were unavailable. The number of rheumatology full-time equivalents for clinic time was calculated based on reported office hours. Descriptive statistics and p-values were calculated as appropriate.

Results from the 2007 survey were compared to the previous 1992, 1997 and 2000 surveys as applicable.

4.0 Findings

4.1 Response rate

A total of 198 rheumatologists in Ontario were identified and were mailed a questionnaire. Out of the 198 questionnaires mailed, 34 were excluded as these rheumatologists were not practicing in Ontario (i.e., retired, solely doing research, on a leave of absence or had moved out of province). Of the 164 remaining potentially eligible questionnaires, 152 were returned (response rate 92.6%) and were used for analysis. All (100%) of the 152 responding rheumatologists answered questions in Part 1 of the questionnaire. Seventy-four percent (n=111) of respondents also answered questions in Part 2, representing an overall response rate of 67.7% (111/164) for this part, although the response rate varied by question.

To determine whether the sections with fewer questions completed or with more missing information were representative of rheumatologists in Ontario, comparisons of the responses were made between the rheumatologists who completed only Part 1 and those who completed both Parts 1 and 2 (Table 1). There were no significant differences between the two groups.

Table 1. Comparison of characteristics of respondents to the 2007 ACREU Survey of Ontario Rheumatologists

	Respondents to questions in Part 1 only	Respondents to questions in Parts 1 & 2
Female (%) [a]	36.6	36.9
Mean years in Practice [b]	19.9	18.0
Rheumatologists practicing out of more than one LHIN (n)	7.3	13.5
Primary clinics in regions with population < 600,000 [†] **(n)**	9.8	5.4
Mean clinics[‡] **per week** [c] [§]	7.2	8.4
Mean hours per week [c] [§]	28.9	33.5
Number (%) response by grouped [‖] **LOCAL HEALTH INTEGRATION NETWORKS (LHINs)** [d]		
South and West	9 (22.0)	22 (19.8)
GTA	24 (58.5)	69 (62.2)
East and North	8 (19.5)	20 (18.0)
ONTARIO	**N=41**	**N=111**

a p-value = 0.62
b p-value = 0.19
c p -value = 0.06
d p-value = 0.92
[†] LHINs with population less than 600,000: South East, North Simcoe Muskoka, North East, North West
[‡] One clinic = 4 hours of service
[§] Mean clinics and mean hours calculated with n=110
[‖] Regions: *South and West* = Erie St Clair; South West; Waterloo Wellington; Hamilton Niagara Haldimand Brant. *GTA (Greater Toronto Area)* = Central West; Mississauga Halton; Toronto Central; Central; Central East. *East and North* = South East; Champlain; North Simcoe Muskoka; North East; North West.

4.2 Part 1: Service provision

The findings in this section of the report relate to **Part 1** of the questionnaire completed by 152 practicing rheumatologists in Ontario in 2007.

4.2.1 Rheumatology provision

The 152 rheumatologists in Ontario represent a provision of 126 full-time equivalents (FTEs) for the province as a whole (an FTE is based on the American College of Rheumatology standard of at least 32 hours per week of direct clinical care)[39]. The overall provincial per capita provision was 1.20 rheumatologists per 100,000 population (Table 2), equivalent to 1.00 FTE per 100,000 population.

Table 2 shows the number of rheumatologists responding to the survey by LHIN, as well as the provision per 100,000 population. Apart from the South East LHIN, the absolute number of

rheumatologists tended to be higher in the LHINs with teaching hospitals (LHINs that have a university that offers medical training). The LHINs with teaching hospitals are: South West, Hamilton Niagara Haldimand Brant, Toronto Central, South East and Champlain. LHINs that included parts of the Greater Toronto Area also had a relatively high number of rheumatologists. The per capita availability of rheumatologists varied by LHIN from a high of 4.74 per 100,000 population in Toronto Central to 0.31 per 100,000 population in Erie St. Clair. Sensitivity analyses taking into account the location of the 12 (7.3%) non-responding rheumatologists did not substantially alter the overall relative magnitude or pattern of provision.

Twelve percent (n=18) of rheumatologists practiced in more than one LHIN. While traveling rheumatologists can make an important contribution to care, most cross-boundary flow occurred between urban LHINs, primarily the Greater Toronto Area. The main exception was the North East, where traveling rheumatologists more than doubled the care for that LHIN.

Table 2. Overall number and per capita provision per 100,000 population of practicing rheumatologists, by Local Health Integration Network in Ontario, 2007

Local Health Integration Networks	Number of rheumatologists			Rheumatologists/100,000 population	
	Primary clinic only †	Proportion (%)	All clinics	Primary clinic only †	All clinics
Erie St. Clair	2	1.32	2	0.31	0.31
South West*	9	5.92	9	0.97	0.97
Waterloo Wellington	3	1.97	4	0.42	0.56
Hamilton Niagara Haldimand Brand*	17	11.18	25	1.24	1.82
Central West	6	3.95	10	0.77	1.28
Mississauga Halton	9	5.92	14	0.82	1.28
Toronto Central*	46	30.26	55	3.97	4.74
Central	17	11.18	27	1.06	1.68
Central East	15	9.87	20	1.01	1.35
South East*	3	1.97	3	0.62	0.62
Champlain*	18	11.84	24	1.51	2.02
North Simcoe Muskoka	3	1.97	4	0.73	0.97
North East & North West	4	2.63	9	0.33	0.55
ONTARIO	**152**	**100.00**	**--**	**1.20**	**--**

* LHINs with teaching hospitals
† Does not take into account rheumatologists that travel to other clinic locations

The overall amount of direct clinical care provided by rheumatologists was 38.3 hours (9.6 half days) per week per 100,000 population. There were some variations in per capita provision by LHIN, with provision ranging from 114 hours per week per 100,000 population in Toronto Central to 9 hours per week per 100,000 population in South East LHIN (Table 3).The variation by LHIN is illustrated in Figure 1.

Table 3. Provision of rheumatology services by Local Health Integration Network: Hours per week per 100,000 population (all clinics) in Ontario, 2007

Local Health Integration Network	Clinic hours/week	Clinic hours/week/ 100,000 population	†Half days/week/ 100,000 population
South and West			
Erie St. Clair	106.0	16.4	4.1
South West*	286.0	30.7	7.7
Waterloo Wellington	112.0	15.8	4.0
Hamilton Niagara Haldimand Brant*	608.7	44.4	11.1
Overall	*1112.7*	*30.4*	*7.6*
GTA			
Central West	232.5	29.8	7.5
Mississauga Halton	357.0	32.7	8.2
Toronto Central*	1321.5	114.0	28.5
Central	618.3	38.5	9.6
Central East	*472.7*	*31.8*	*8.0*
Overall	*3001.9*	*49.0*	*12.3*
East			
South East*	44.0	9.1	2.3
Champlain*	444.6	37.4	9.4
Overall	*488.6*	*29.2*	*7.3*
North			
North Simcoe Muskoka	106.4	25.9	6.5
North East	102.8	18.4	4.6
North West	40.0	16.8	4.2
Overall	*249.2*	*20.6*	*5.2*
ONTARIO	**4852.4**	**38.3**	**9.6**

* LHINs with teaching hospitals
† One half day = 4 hours of service

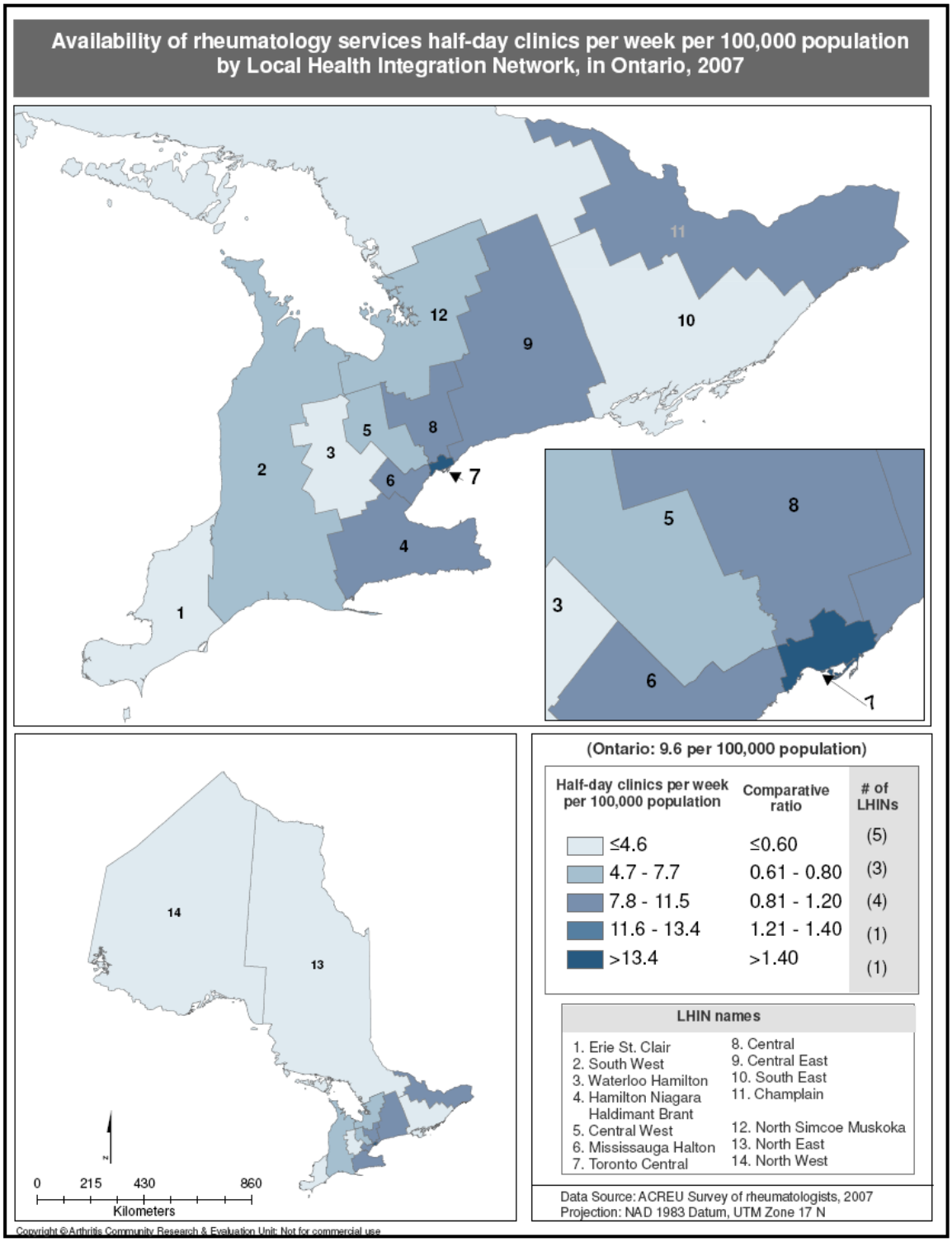


Figure 1. Amount of direct clinical care by Local Health Integration Network in half days per week* per 100,000 population in Ontario, 2007

* One half day = 4 hours of service

4.2.2 Clinical practice hours

On average, rheumatologists in Ontario each provided 32 hours of direct clinical care per week (Table 4). This does not take into account other duties such as administration, teaching or research. There was wide variation across LHINs, which ranged from a high of 53 hours in Erie St. Clair to fewer than 15 hours in the South East LHIN, a LHIN where all of the rheumatologists are based at teaching hospitals (Table 4).

Table 4. Average weekly workload of rheumatologists (in hours) by Local Health Integration Network in Ontario, 2007

Local Health Integration Networks	Average weekly workload of rheumatologists (in hours)¶
	Total time in direct clinical care
Erie St. Clair	53.0
South West*	31.8
Waterloo Wellington	37.3
Hamilton Niagara Haldimand Brand*	35.8
Central West	38.7
Mississauga Halton	39.7
Toronto Central*	28.7
Central	36.4
Central East	31.5
South East*	14.7
Champlain*	26.2
North Simcoe Muskoka	35.5
North East	34.3
North West	40.0
ONTARIO	**32.1**

* LHINs with teaching hospitals

¶ Does not take into account amount of time worked (e.g., full-time versus part-time practice) or other duties such as administration, teaching or research.

4.2.3 Perceptions of waiting time

As expected, the mean waiting time reported by rheumatologists for likely inflammatory patients was lower than that for non-urgent referrals: 3.6 weeks versus 13.4 weeks. Reported waiting times were substantially longer than the provincial average for likely inflammatory patients in the North East and North West LHINs; reported waiting times for likely inflammatory patients were longer than reported waiting times for non-urgent referrals in many LHINs in southern Ontario. The longest reported waiting times for non-urgent referrals were for northern Ontario, with the North West LHIN having the longest (Table 5).

Table 5. Mean reported waiting time (weeks) for non-urgent inflammatory arthritis patients and patients with likely inflammatory arthritis, by Local Health Integration Network in Ontario, 2007

Local Health Integration Networks	Mean reported waiting time (weeks)	
	Likely Inflammatory	Non-Urgent
Erie St. Clair	2.8	9.0
South West*	6.1	22.8
Waterloo Wellington	2.5	14.5
Hamilton Niagara Haldimand Brand*	3.4	13.6
Central West	4.2	11.8
Mississauga Halton	1.5	10.0
Toronto Central*	2.9	11.1
Central	2.8	11.6
Central East	2.6	8.6
South East*	1.9	17.0
Champlain*	4.9	15.8
North Simcoe Muskoka	4.3	11.7
North East	12.0	26.5
North West	10.0	78.0
ONTARIO	**3.6**	**13.4**

*LHINs with teaching hospitals

4.3 Part 2: Practice patterns

The findings in this section are based on the responses of the 111 practicing rheumatologists in Ontario who answered the full questionnaire - Parts 1 and 2 (See section 4.1 on *Response rate*).

4.3.1 Rheumatology workforce characteristics

Slightly more than one-third of rheumatologists replying to Part 2 of the questionnaire were female (37%). The mean number of years rheumatologists in Ontario had been in practice was 18 (median = 18 years). The mean age of rheumatologists was 43 years (median age = 44 years). Female rheumatologists were generally younger than males, mean ages of 36 and 47 years respectively. Nearly one-third of rheumatologists planned to retire in less than ten years (Table 6).

Adults comprised the majority of the patient population. Of those rheumatologists that identified a subspecialty (42%), rheumatoid arthritis was the disease identified most frequently. Lupus, vasculitis, osteoporosis, juvenile arthritis and fibromyalgia were identified less frequently. A few respondents identified a dual subspecialty. Eight percent of respondents reported seeing general medicine patients in their office (Table 6).

Most rheumatologists had a hospital appointment, and more than 40% identified they act as "Most Responsible Physician" (MRP). More than half of rheumatologists had a faculty appointment (Table 6).

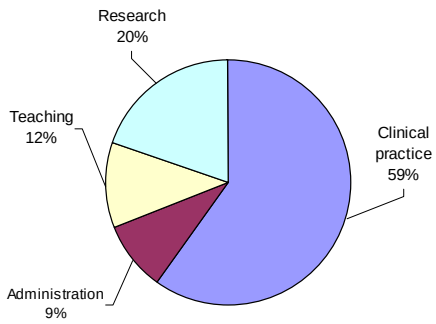
Table 6. Characteristics and practice patterns of rheumatologists in Ontario, 2007

Characteristics / practice patterns	Number of rheumatologists N = 111
Females, n (%)	41 (37)
Mean years in practice as a rheumatologist	18
Mean years in practice, female rheumatologists	12
Mean years in practice, male rheumatologists	22
Mean age (years)	43
Mean age, female rheumatologists	36
Mean age, male rheumatologists	47
Expected year of retirement, n (%)	
Less than 5 years	16 (14)
5-10 years	16 (14)
More than 10 years	55 (50)
Don't know	24 (22)
Adult patients, mean proportion of practice (%)	95
Rheumatologists with subspecialty, n (%)	46 (42)
Sees general medicine patients, n (%)	9 (8)
Has hospital appointment, n (%)	94 (85)
Acts as "Most Responsible Physician" (MRP) in local hospital, n (%)	44 (47)
Rheumatologists with faculty appointment, n (%)	
Full-time	36 (33)
Part-time	11 (10)
Clinical associate appointment	13 (12)
No faculty appointment	42 (38)

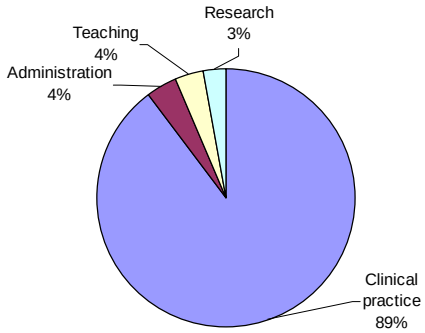
4.3.2 The work week of rheumatologists

Clinical practice comprised the largest proportion of a rheumatologist's time (Figure 2). Rheumatologists in teaching LHINs with a university that offers medical training spent significantly less time in clinical activities ($p<0.0001$) than their counterparts in LHINs without teaching hospitals. Conversely, this group spent significantly more time in research ($p<0.0001$), teaching ($p<0.0001$) and administration ($p<0.01$) compared with rheumatologists in non-teaching LHINs.

Figure 2. Proportion of time participating in clinical practice, teaching, administrative work and research, among rheumatologists in Local Health Integration Networks with and without teaching hospitals in Ontario, 2007



Mean proportion (%) of time devoted to various duties in LHINs with teaching hospitals



Mean proportion (%) of time devoted to various duties in LHINs without teaching hospitals

In their clinical practice, in addition to seeing rheumatology outpatients, rheumatologists also had other responsibilities, with on-call rheumatology responsibilities being the highest proportion of these clinical responsibilities (Table 7).

Table 7. Rheumatologists with clinical responsibilities in addition to seeing rheumatology outpatients in Ontario, 2007

Clinical responsibilities in addition to seeing rheumatology outpatients (N=111)	**n**	**%**
After hours on-call responsibilities for rheumatology	64	58
In-hospital internal medicine ward	22	20
On-call hours for general internal medicine	22	20
After hours on-call responsibilities other than rheumatology services	17	15
Other	16	14
Hospital emergency room rotation	12	11
Internal medicine out-patient clinic	3	3

Note: Percentages do not add to 100%, as respondents could select more than one clinical responsibility, and some had no additional responsibilities

4.3.3 Time trends in provision of rheumatology services

Table 8 compares findings of the current survey with those of the 1992[40,41], 1997[15,18], and 2000[17,21,22] ACREU surveys of rheumatologists. There continue to be fewer female than male rheumatologists. While there was an increase in the proportion of female rheumatologists from 2000 to 2007 (34% vs. 37%), this difference was not significant (p=0.39). The mean number of years in practice increased significantly (p=0.03) over time since 1997. There was no substantial difference in per capita provision of service (i.e., number of rheumatologists per 100,000 population and half days per week per 100,000 population), with slightly higher rates for 2007 with respect to clinical half days per week.

Table 8. Time trends in rheumatology service provision, 1992-2007: ACREU surveys of Ontario rheumatologists

Year of survey	Percent female	Mean years in practice	Provision per 100,000 population	
			Number of rheumatologists	Clinical half days† per week
2007	37	18	1.20	9.58
2000 [17]	34	16	1.35	8.93
1997 [15]	NA	15	1.50	8.89
1992 [42]	25	14	1.26	NA
p-value (2000-2007)	0.39	0.03*	-	-

* Significant difference
† One half day = 4 hours of service
NA = Not available

Median reported waiting times significantly increased since 2000 for both likely inflammatory and non-urgent referrals. There was no change over time with respect to difficulties scheduling follow-up appointments, with 57% in 2007 reporting such difficulties. The proportion of rheumatologists able to see urgent referrals within a week "all the time" decreased from 2000 (43%) to 2007 (33%) (Table 9).

Table 9. Comparison of indicators of ease of access to the rheumatology care provided by rheumatologists in Ontario, 2000 and 2007

	2000 N=152	**2007** N=149	**p-value**
Median waiting time for likely inflammatory ambulatory patients (n=143)	2 weeks	2.5 weeks	<0.0001*
Median waiting time for non-urgent ambulatory patients (n= 145)	8 weeks	10 weeks	<0.0001*
Rheumatologists with difficulties scheduling follow-up appointments, n (%)	75 (59)	61 (57)	0.68
Ability to see urgent referrals within a week, n (%):			
• Yes – all the time	66 (43)	49 (33)	0.03*
• Yes – most of time/occasionally	83 (55)	95 (64)	
• Rarely/never	3 (2)	5 (3)	

Note: All respondents were included in analysis as this question was in Part 1 of the questionnaire.
Note: Analysis excludes missing values
* Significant difference

As in 2000, the patient population was primarily adults. Significantly more rheumatologists identified having a subspecialty in 2007 than in 2000 (42% vs. 30%). The proportion of rheumatologists with a full-time faculty appointment remained consistent (Table 10).

Significantly fewer rheumatologists identified "changes to pattern of practice in previous three years" in 2007 compared with in 2000 (51% vs. 72%). Of these, in 2007 lower proportions reported increases in third party billing (i.e., medico-legal, independent medical services, pharmaceutical company).

Table 10. Comparison of characteristics and practice patterns of rheumatologists in Ontario, 2000 and 2007

	2000 N=131	**2007** N = 111	**p-value**
Adult patients, mean proportion of practice (%)	95	95	0.87
Rheumatologists with subspecialty, n (%)	37(30)	46 (42)	0.01*
Rheumatologists with full-time faculty appointment, n (%)	43(33)	36 (33)	
Changes to pattern of practice in previous 3 years	N=123	N=109	**p-value**
Yes	89 (72)	56 (51)	<0.0001*
Of the rheumatologists who identified they experienced a change in the patterns of their practice:	**Proportion (%) of respondents who experienced**		
	Increase	*Increase*	
Emergency	38	33	
General internal medicine	35	35	
Medico-legal	70	36	
Independent medical services	85	43	
Pharmaceutical company	84	65	

* Significant difference

Two thirds of rheumatologists indicated that their practice volume was increasing, compared with three years ago. This is a similar finding to the 2000 data, with a slightly higher proportion of rheumatologists in 2007 reporting an increase in practice volume and a lower proportion reporting a decrease, although differences overall were not significant (Table 11).

Table 11. Comparison of the number and proportion of rheumatologists who experienced a change in the volume of their practice in the previous three years in Ontario, 2000 and 2007

Volume of rheumatology practice	**2000** N=124	**2007** N=108
	n (%)	n (%)
Increasing	76 (61)	73 (68)
Decreasing	9 (7)	4 (4)
Stable	34 (27)	27 (25)
Other	5 (4)	4 (4)

Note: Analysis excludes missing values

4.3.4 Barriers to practicing

In 2007 all rheumatologists responding to this section of the questionnaire reported at least one barrier to practicing as they would like. The most frequently mentioned barrier was “financial barriers, such as affordability of drugs to patients”, which was also the top ranked barrier in the 2000 survey. The second and third most frequently identified barriers were “inappropriate or incomplete referrals by GPs” and “lack of timely information”, respectively. “Billing policies and regulations for consultation and follow-up visits” as a barrier were not as frequently reported as

in 2000, when it was the second highest reported barrier. This difference was significant (p<0.0001) (Table 12).

Table 12. Comparison of the proportion of rheumatologists reporting various barriers that prevent rheumatologists practicing as they would like in Ontario, 2000 and 2007

Reported Barriers	2000 N=127	2007 N=108
	%	%
Financial barriers such as affordability of drugs to patients	83	79
Inappropriate or incomplete referrals by GPs†	Not asked	70
Lack of timely information†	Not asked	62
Long waiting times	61	56
Lack of or delayed referrals by GPs†	Not asked	49
Lack of access to allied health professionals	55	42
Billing policies/regulations for consultation and follow-up visits*	72	33
No access to hospital beds	41	18
Other	21	18
None	5	0
Non-referral by GP‡	44	Not asked

* Significant difference: p<0.0001
† Included this response option in 2007 questionnaire only
‡ Included this response option in 2000 questionnaire only

Rheumatologists were also asked whether it was possible to make ends meet from rheumatology practice alone (without resorting to third party billing, pharmaceutical trials, internal medicine patients). Twenty percent indicated that this was “not possible” and slightly more than half of respondents could do so with “some” (34%) or “a lot of” (23%) difficulty. While only 20% identified they could make ends meet “easily”, when compared with data from the 2000 survey, there were significant differences (p<0.0001); it appeared to be easier to make a ends meet from rheumatology alone in 2007 than in 2000 (Table 13).

Table 13. Comparison of the number and proportion of rheumatologists who had difficulty making ends meet from rheumatology practice alone (without resorting to third party billing, pharmaceutical trials, or internal medicine patients etc) in Ontario, 2000 and 2007

Ability to make ends meet	2000 N=123	2007 N=108
	n (%)	n (%)
Easily	9 (7)	22 (20)
With some difficulty	38 (31)	37 (34)
With a lot of difficulty	36 (30)	25 (23)
Not possible	35 (28)	22 (20)
No opinion	5 (4)	2 (2)

Note: Analysis excludes missing values

4.3.5 Care for patients with inflammatory arthritis

Most (106/111; 95%) rheumatologists responding to Part 2 of the survey saw patients with inflammatory arthritis. Approximately half of patients seen in the last month had inflammatory arthritis. The mean reported proportion of inflammatory arthritis patients referred to a rheumatologist within three months of symptom onset was 44%. There were no differences for LHINs with teaching hospitals compared with those without teaching hospitals (Table 14a).

Table 14a. Comparison of the care for patients with inflammatory arthritis by rheumatologists in Local Health Integration Networks with and without teaching hospitals in Ontario, 2007

	LHINs with teaching hospitals N = 64	**LHINs without teaching hospitals** N = 42	**ONTARIO** N = 106
Mean proportion (%) of patients seen in the last month with inflammatory arthritis	56	51	54
Mean proportion (%) of Inflammatory caseload referred within 3 months of onset	43	45	44

Note: Analysis excludes missing values

The majority of rheumatologists reported their inflammatory caseload had either remained the same or had increased. Forty percent of rheumatologists identified that the proportion of inflammatory arthritis patients had increased over the past year, while for more than half it remained the same (Table 14b).

Respondents were also asked about use of biologics and combination disease-modifying anti-rheumatic drugs (DMARDs) for their patients. Combination DMARDs continued to be the treatment of choice, with over two thirds of rheumatologists reporting that more than 50% of their patients received this therapy. The use of therapies differed somewhat between LHINs with and without teaching hospitals. In LHINs with teaching hospitals the proportion of rheumatoloists prescribing combination DMARDs to more than 50% of their patients was somewhat lower than other LHINs, but this appeared to be offset by a greater use of biologics. Almost half of rheumatologists in LHINs with teaching hospitals reported that over 20-50% of their patients received this therapy, compared to a quarter in other LHINs (p=0.02). Overall the use of biologics appeared to be increasing with 42% of rheumatologists in LHINs with teaching hospitals and 81% in LHINS without teaching hospitals reporting that biologic prescription had increased in the past year (p=0.05). One-quarter of rheumatologists in Ontario supervised an infusion clinic (Table 14b).

Table 14b. Comparison of the care for patients with inflammatory arthritis by rheumatologists in Local Health Integration Networks with and without teaching hospitals in Ontario, 2007

	LHINs with teaching hospitals N = 69		**LHINs without teaching hospitals** N = 42		**ONTARIO** N = 111	
	n	% of 69	n	% of 42	N	% of 111
Patients with inflammatory arthritis						
Increased	23	33	21	50	44	40
Decreased	6	9	0	0	6	5
Remained the same	37	54	20	48	57	51
Not stated †	3	4	1	2	4	4
Patients receiving combination DMARD therapy						
More than 50%	43	62	34	81	77	69
20-50%	19	28	8	19	27	24
Less than 20%	3	4	0	0	3	3
Do not prescribe combination DMARD therapy	1	1	0	0	1	1
Not stated	3	4	0	0	3	3
Patients receiving combination DMARD therapy *						
Increased	8	12	20	48	28	25
Decreased	0	0	0	0	0	0
Remained the same	58	84	22	52	80	72
Not stated	3	4	0	0	3	3
Patients receiving biologics *						
More than 50%	0	0	2	5	2	2
20-50%	33	48	11	26	44	40
Less than 20%	32	46	29	69	61	55
Do not prescribe biologics	1	1	0	0	1	1
Not stated	3	4	0	0	3	3
Patients receiving biologics *						
Increased	42	61	34	81	76	69
Decreased	0	0	1	2	1	1
Remained the same	24	35	7	17	31	28
Not stated	3	4	0	0	3	3
Supervise an infusion clinic	18	26	11	26	29	26

* Significant difference

† Proportions in this table include missing values (i.e., “not stated”)

4.3.6 Emerging models of care for rheumatology

Rheumatologists were asked about their involvement with comprehensive team care/ coordinated care programs, early arthritis clinics for rheumatology patients, telemedicine, or other new emerging models of care. Forty-five percent (n=50) of rheumatologists who responded to Part 2 of the questionnaire reported that they were involved in new emerging models of care (Table 15).

Those rheumatologists who identifed being involved with emerging models of care were more commonly involved in early arthritis clinics and comprehensive team care/coordinated care programs than with telemedicine or other models of care (Table 15). Forty-four percent of those who were involved in emerging models of care participated in both an early arthritis clinic and comprehensive team care/coordinated care programs.

A higher proportion of rheumatologists who practice in LHINs with teaching hospitals participated in emerging models of care compared with those in non-teaching LHINs although differences were not significant (Table 15).

Table 15. Comparison of the number and proportion of rheumatologists who participated in emerging models of arthritis care, in Local Health Integration Networks with and without teaching hospitals in Ontario, 2007

Model of care	**LHINS with teaching hospitals** N = 69		**LHINS without teaching Hospitals** N = 42		**ONTARIO** N=111	
	n	% of 69	n	% of 42	N	% of 111
Comprehensive team care/ Coordinated care program	22	32	7	17	29	26
Early arthritis clinic for rheumatology patients	18	26	7	17	25	23
Telemedicine	7	10	2	5	9	8
Other	7	10	1	2	8	7

4.3.7 Availability of and referral to services and programs

In this section aggregate data are presented for the province of Ontario. The denominator for the proportion varies logically depending on the question.

Rheumatologists answered questions about services and programs to help patients manage their arthritis. Respondents specifically reported on the availability of services, whether they referred patients to such services (if available), the extent to which they refer, and their perceptions regarding waiting times. These services included: orthopaedic surgery (total joint replacement, other surgery), The Arthritis Society (therapy, self-managment, education), and non-pharmacological therapy (orthotics, phyiotherapy, occupational therapy, hydrotherapy, social work, community exercise programs, dietician).

Overall, availability of services for patients to manage their arthritis reported by respondents of Part 2 of the questionnaire was quite high. Professionals and services less available were dieticians, social workers, community exercise programs and hydrotherapy. Of those with services available, the proportions of rheumatologists reporting they referred to dieticians and

The Arthritis Society for arthritis self-management were the lowest, with perceived availability exceeding the proportion of referrals for self-management (Figure 3a).

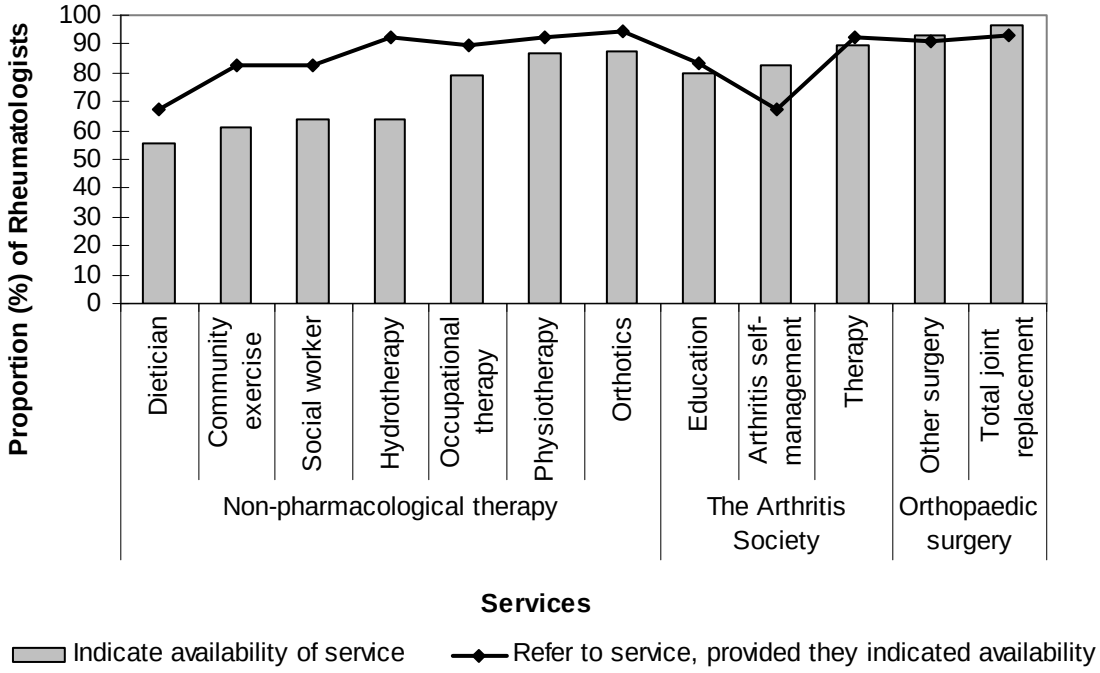


Figure 3a. Management of patients: Proportion of rheumatologists indicating availability of services for patients and who refer patients to services if services are available in Ontario, 2007

While most rheumatologists who reported available services made referrals to a range of services, the average percentage of patients being referred to specific services varied by service. Physiotherapy was the service with the highest reported percentage of patients referred by rheumatologists surveyed, at 35% (Table 16).

Table 16. Average percentage of patients referred to the various services by rheumatologists in Ontario, 2007

Type of service	Average percentage (%) of patients referred	Number of respondents (n) who stated a percentage
Orthopaedic surgery		
Orthopaedic surgeon for total joint replacement	15	76
Orthopaedic surgeon for other surgery	10	69
The Arthritis Society		
Therapy	24	70
Education	29	52
Arthritis self-management	24	45
Non-pharmacological therapy		
Physiotherapy	35	73
Orthotics	30	67
Community exercise programs	30	42
Hydrotherapy	23	50
Occupational therapy	19	62
Dietician	12	33
Social worker	9	45

Feedback on appropriateness of waiting times for these programs and services varied. Waiting times for orthotics had the highest proportion of rheumatologists reporting the waiting times as "appropriate". Dieticians and orthopaedic surgery had the lowest proportion of respondents identifying the waiting times as "appropriate" (Figure 3b).

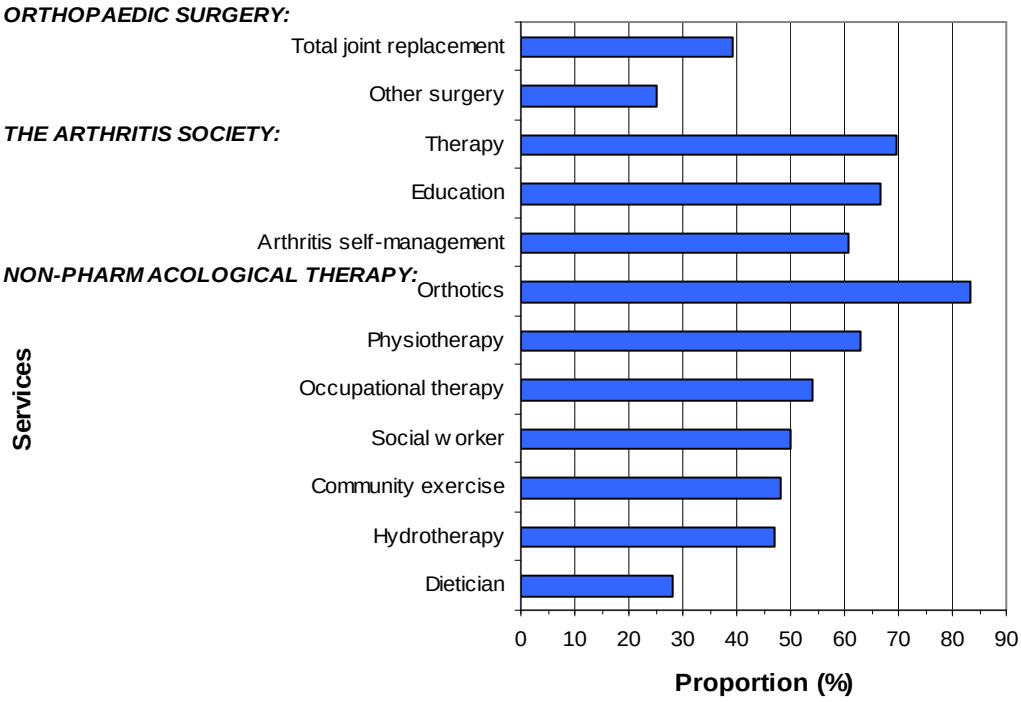


Figure 3b. Management of patients: Proportion of rheumatologists who believe waiting times are appropriate for services in Ontario, 2007

5.0 Discussion

This *2007 Survey of Rheumatologists in Ontario* represents the latest in a series of ACREU studies documenting issues with the provision of rheumatology in Ontario. While there are some encouraging results with respect to provision, the lack of a substantial increase in the number of rheumatologists over the past seven years is of concern given the aging population and subsequent increasing demand for rheumatology services. Although the situation is not necessarily worse, there has been little improvement, and provision is still less than optimal. Using data from Statistics Canada, the Canadian Council of Academic Rheumatologists (CCAR) suggests a provision ratio of 1.9 per 100,000 population based on estimated population growth to 2026[27]. The current provision of 1.2 per 100,000 (equivalent to 1.0 FTE per 100,000) falls well below this benchmark. The CCAR estimates that an overall manpower increase of 64% will be required by 2026 to provide Canadians with sufficient access to care[22,27]. Based on the results of the 2007 rheumatology survey, it is clear that the current supply of rheumatologists may not be adequate to meet the existing and future clinical need.

While the response rates to the survey were high (93% for Part 1 and 68% for Part 2), they were somewhat lower than for the 2000 survey. However, the scope of the 2007 survey was broader with more emphasis on practice patterns, and the additional length and complexity of the questionnaire may have deterred respondents. Our sensitivity analyses suggest that the small amount of non-response to Part 1 does not affect overall estimates. The response rate to different sections of Part 2 of the survey on practice patterns was lower and more variable, and this may affect the representativeness of the findings, particularly the section on management of patients and referral to other services and programs.

Concerns regarding the future supply of rheumatologists in Canada[27], the United States[37] and the UK[43] have been documented. The increasing mean number of years in practice for rheumatologists in Ontario in 2007 implies an aging of this physician population; the mean age was 43 years, with several respondents over age 65 years. Hanly[44] reported an increasing mean age of academic rheumatologists in Canada from 47.9 to 48.9 years from 1998 to 2002. Weinblatt[45] noted a similar aging of this specialty in the United States. While physicians typically continue to work beyond the conventional retirement age of 65 years[44], early retirement is a general workforce trend, and it is more common today than in the past[46]. Nearly one-third of rheumatologists indicated they planned to retire within the next ten years.

The increasing proportion of females practicing rheumatology in Ontario is consistent with findings of other reports in Canada[44] as well as other jurisdictions[24,37]. Greater proportions of females and younger individuals practicing rheumatology may mean less provision due to the greater likelihood of these groups to practice part-time or to provide fewer hours overall. In the United States, one study reported that male rheumatologists provide 34% more patient visits than do female rheumatologists[37], which is likely related to a higher number of female physicians who work part time rather than full time, as seen in the growing trend for part-time work[24].

In the United States, Deal et al.[37] suggest that a 30% increase in fellowship positions every five years beginning in 2005 would be needed in order to resolve the predicted gap. Unfortunately, recruitment to rheumatology is a challenge. In Canada, barriers to recruitment include a lack of suitable applicants, lack of financial resources for trainees and lack of physician resources[44]. The number of internal medicine residents currently seeking further sub-specialty training in rheumatology is on the decline[27,44,45]. Sub-specialization in rheumatology is not currently

considered to be financially lucrative. Reports in the United States have shown that the additional training required to complete subspecialty training in rheumatology was associated with negative salary returns as compared to other specialties[47]. As noted by Weinblatt [45], inadequate remuneration for patient care remains a major problem for rheumatologists in the United States, which leads to a greater dependence on revenue enhancing strategies such as clinical trials and infusion centres. For Canada, given the amount of debt facing today's medical graduates and the amount of time invested in education, it is not surprising that recruitment in rheumatology continues to fall [27,44].

Geographic misdistribution of specialists in Canada has long been cited to be a major barrier for access to care[17,35,36,48]. Regional disparities with respect to rheumatology services have been reported in provision studies of many other jurisdictions as well[25,49,50]. In Canada, Shipton and colleagues[36] investigated the relationship between DMARD therapy and specialty care and found that individuals living in Ontario counties with the highest proportional use of specialist care were 1.9 times more likely to have received DMARDs, compared with individuals living in counties with the lowest proportional use. They speculated further that limited access to rheumatoid arthritis related specialist care contributes to the under-treatment of rheumatoid arthritis in Ontario and perceived long waiting times have a deterrent effect on referrals by general and family practitioners. A recent Canadian study by Feldman and colleagues[51] found that the majority of patients in Quebec suspected of having new-onset rheumatoid arthritis do not receive rheumatology care.

As in previous surveys, rural areas in the northern part of the province remained under-serviced. However, lack of ready access is not only a problem in remote areas but relates to under-provision of local rheumatology services in other areas across the province. LHINs of Erie St. Clair and Waterloo Wellington also had low provision rates comparable to that of the North. The low provision in the South East LHIN, which includes Kingston and Queen's University, is additionally concerning as this is a major teaching centre, which may have implications for the recruitment of Queen's University medical students into the profession.

The increase in reported waiting times since the 2000 survey found in the 2007 survey may be indicative of the increasing burden of arthritis and related conditions in the population. As discussed earlier, the level of rheumatology services in Ontario has remained relatively unchanged from 1997 to 2007. The aging of the population and concomitant increasing disease prevalence results in a decrease in the amount of services available for each individual seeking care as the demand for services grows. Not surprisingly, regionally in Ontario, an inverse relationship between the level of rheumatology service provision and waiting time for non-urgent patients has been reported[17]. In 2007 waiting times continue to be a concern particularly for the under-serviced areas of northern Ontario.

Waiting time has been described as an important factor impeding general access to care in Canada[32]. The reported waiting time for new non-urgent patients was identified as being substantially longer and more variable than for new patients with inflammatory arthritis, a finding similar to that of the 2000 survey[22]. While rheumatologists appear to triage so that urgent care referrals receive priority, the reported waiting time for both patients with likely inflammatory arthritis and non-urgent ambulatory patients has increased. Despite their efforts, only one-third of the rheumatologists surveyed reported that they were able to accommodate urgent referrals within a week all of the time, and this proportion appears to have decreased since the last survey[22]. Half of surveyed rheumatologists in 2007 reported that long waiting times were a barrier to the provision of care. Given the importance of early treatment for patients with inflammatory arthritis this is an issue for concern.

Waiting times data from other jurisdictions are similarly discouraging. Rheumatology specific waiting times in New Zealand ranged from two to six weeks for urgent visits to a high of 24 weeks for routine visits in most health regions[25]. In the United States, Deal et al.[37] reported an average waiting time for new patients to see a rheumatologist of 38 days. In the UK[52] mean waiting times were 43 days and 105 days for "fast track" and "ordinary" appointments respectively, with a continuing increase in rheumatology patient workload[53]. As demand for rheumatology services continues to increase, long waiting times, patient dissatisfaction and a decrease in quality of care will continue to plague individuals seeking care[37]. Although waiting lists are used as a surrogate indicator of adequacy of service provision, they do not take into account unmet need of patients who are managed by general practitioners or referred to a less appropriate specialty due to lack of access to rheumatology services[25].

As expected, rheumatologists in LHINs with teaching hospitals spent significantly less time in clinical activities than their non-academic counterparts. The clinical practice time of rheumatologists in teaching LHINs was 60% (compared with 90% in LHINs without teaching hospitals), a slightly higher proportion than in Hanly's study of academic rheumatologists, which reported that 54% of the physician's time was devoted to clinical care[44] . Other research has documented rheumatologists' participation in various non-clinical activities such as teaching and research[43,44,54]. In the UK, rheumatology consultants divide their time amongst activities related to direct clinical care (i.e., clinics, ward rounds and associated paperwork) and supporting professional activities at a rate of approximately 3:1 for a typical 40-hour work week[24]. This finding is similar to that of the 2007 Ontario rheumatology survey for the province as a whole (71% clinical practice time). In teaching settings, provision rates for clinic hours may under-represent actual availability of services as we did not take into account the contribution to rheumatology services made by residents and fellows. This is of importance given that the majority of rheumatologists in Canada hold full or part-time appointments within the academic arthritis centres[27,44,55]. In the present study only 38% of rheumatologists had no faculty appointment.

Beyond barriers related to recruitment, practicing rheumatologists also reported several barriers within the existing scope of practice. In the 2007 survey, as well as the 2000 survey, the most frequently identified barrier was "financial barriers such as the affordability of drugs to patients". The majority of medical costs for Canadians are drug-related, and it is estimated that approximately 31% of Ontarians do not have drug insurance[22]. A lack of insurance can be especially devastating for patients with inflammatory arthritis in Canada, for whom treatment of inflammatory arthritis can cost more than $15,000 CDN.

An important barrier that was evident in the 2000 rheumatology survey, but less important for rheumatologists in 2007, was "billing policies/regulations for consultation and follow-up"[22]. At the time of the 2000 survey billing regulations permitting only one in-depth consultation per patient per year for specialist care were in place. Many felt that this fee schedule did not adequately reimburse specialists for treating patients that require close monitoring and multiple follow-up visits, such as those with rheumatoid arthritis[22;56]. Since the 2000 survey there have been modifications to billing policies affecting rheumatology in Ontario. Specifically in 2000, general fee codes were changed to more specific billing codes to reflect accepted standards of practice for rheumatologists and other medical specialists[57] which made it easier for rheumatologists to be remunerated for their specialist care[58]. To more accurately reflect the work of specialists, such as rheumatologists, a "complex medical specific re-assessment" code was introduced in 2002[59] to address complex, obscure, or serious conditions[58]. Lastly, a "chronic disease assessment premium" was introduced in 2005[60] which made it easier for specialists to ensure

adequate follow-up of patients with chronic diseases such as inflammatory arthritis. The benefits of these modifications appear to be reflected in the results of the 2007 survey, and have had a positive impact on rheumatologists' perceptions regarding ability to make ends meet financially.

Another barrier identified in the survey was the referral process. In the 2007 rheumatology survey "inappropriate or incomplete referrals by GPs (general practitioners)" was the second most frequently reported barrier to practice, identified by 70% of rheumatologists, and "lack of or delayed referrals by GPs" was highlighted as a barrier for nearly half of survey respondents. It is generally recommended that management of rheumatoid arthritis and related conditions that have the potential for serious or life-threatening consequences be managed by a rheumatologist[2-4,61]. Consultation with a rheumatologist in Ontario requires that a patient first be seen by a primary care physician. Past research has identified that often both GPs and specialists are dissatisfied with the referral process[22,62]. Deficiencies of the referral process from primary care provider to rheumatologist have been documented elsewhere[63-66]. Most authors agree that high frequency, inappropriateness and delays in referrals contribute to increased waiting times and compromise the quality of health care[66,67].

The implications of misdiagnosis or over-diagnosis and resulting inappropriate patient referrals are perhaps most noticeably manifested in timeliness of care. The benefit of early referral and treatment has been well established [68-70]; treatment of early rheumatoid arthritis with DMARDs can slow the progression of joint damage substantially and prevent disability[36]. A recent study in the Greater Toronto Area showed only 23% of patients with rheumatoid arthritis were started on DMARD therapy within three months of symptom onset[71]. The median time between symptom onset to DMARD initiation was over six months with delays in the identification of inflammatory arthritis and referral to a rheumatologist being a key contributor. Several studies have highlighted potential solutions to ensuring timely care, including, the improved communication between GPs and specialists[66], joint consultation between GPs and rheumatologists to influence the referral behaviour of GPs to decrease referral and potentially lead to a reduction of waiting lists[67], and diagnostic triage by GPs, Registered Nurses, or other appropriately trained health professionals have been posed as ways to regulate frequency and appropriateness of referrals[72].

As rheumatoid arthritis is a heterogeneous disease, no single intervention should be expected to be most effective for all patients[14]. During the past decade biologic therapies have revolutionized the management of rheumatic disease and have provided another treatment option[14]. Clinical guidelines currently recommend the use of biologics after failure of traditional DMARDs[13]. A positive finding from the 2007 survey is that combination DMARDs and biologics are being prescribed by most rheumatologists. The increase in biologic prescriptions is encouraging, and was particularly noted for LHINs with teaching hospitals. As more data become available from randomized control trials indicating the benefits of biologics, the demand for these drugs from physicians and patients is likely to increase. In a recent systematic review of the cost-effectiveness and cost-utility of biologic DMARD treatments it was demonstrated that while biologics are associated with greater costs than traditional DMARDs (including costs of drugs and of health resource utilization), they produced more quality-adjusted life-years (QALYs). The studies included in the review suggested that the additional benefits of biologics after traditional DMARDs fail may be worth the additional cost compared with traditional DMARD continuation[13].

Given the heavy burden of arthritis on individuals who have the disease and on the health care system, health professionals, researchers and policy makers have in recent years become

increasingly interested in exploring alternative models of care. Approximately half of respondents of this survey were involved in new emerging models of care. In the literature, in addition to a joint-consultation model[67], several other models of care have emerged for the treatment of arthritis and rheumatism. These include team care[73] and the use of expanded role practitioners[74]. The problem of access to specialist care, especially in remote areas, has also led to the investigation of the usefulness and efficacy of telemedicine in rheumatology[75,76]. With few rheumatologists in Ontario traveling outside the LHIN of their primary clinic to provide services, access to specialty care may be improved by promoting visiting specialist services or specialist outreach clinics and by telemedicine, particularly for rural areas[77]. These models of managing arthritis care will likely grow in importance as the prevalence of arthritis continues to increase.

The complex, often multi-system nature of inflammatory joint diseases and the variety of health professionals involved in the management of these diseases present challenges with care provision[11]. In addition to medications, evidence-based practice for arthritis management recommends a variety of non-pharmacological interventions based on disease-type, including orthopaedic surgery, rehabilitation and exercise, and patient self-management[78]. While most rheumatologists in the 2007 survey made referrals to a range of services, there was variation in the perceived availability of different types of service by LHIN, and the proportion of rheumatologists making referrals when services were available varied. In his assessment of the rheumatology multidisciplinary team model of care, Sandhu[11] similarly reported wide variations in referral patterns within rheumatology departments regionally as well as in individual departments. As with our study, self-reported rates of referral to team members were low with fewer than half of patients reporting having seen a physiotherapist or occupational therapist[11]. Also, referral to other services by rheumatologists in our study seemed to go hand-in-hand with perceived availability of such services and perceived waiting times.

In order to make the best use of the resources available, there are several areas in which adequacy and efficiency of the care provided by rheumatologists needs to be investigated. It is clear that associations between rheumatology human resources and quality of health care requires further study[79] and that geographic equity should be taken into account in order to characterize difficulties in access and provision of care[80]. Current information about day-to-day practice such as that provided in this reports represents a starting point for solutions aimed at redesigning practice patterns to improve access to care, and also to prevent time for patient care from being eroded by increasing administrative demands[37]. Further, there is room for improvement in the knowledge and skills of primary care providers with respect to the management of arthritis and rheumatism [81], and the contributions other health professionals, such as physical therapists and nurse practitioners, have potential to be developed further[44,74].

6.0 Conclusion

When compared with the 2000 data, there appears to be no substantial increase in 2007 of the amount of rheumatology service, which is problematic given that the number of people with arthritis is increasing. However, changes in billing policies have had a positive effect on rheumatology practice and may influence perceptions of potential trainees regarding rheumatology as a profitable specialty. Resolution of Canada's growing rheumatology human resource shortage will require a multi-faceted strategy that addresses the concerns of both training and established rheumatologists. A comprehensive solution that is rooted in evidence-based research is needed to better understand how to increase the number of rheumatologists

that are training and remaining in Canada, and how to best utilize available health human limited resources in order to improve availability of care. Attention also needs to be paid to geographic variations in the availability of rheumatology services and ways to ensure appropriate and timely access for individuals with arthritis in Ontario needing care wherever they may live.

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Appendix A. Information Letter

Date

Dr. XXXX
Address

Dear Dr. XXXX,

The Arthritis Community Research and Evaluation Unit (ACREU) in partnership with the Arthritis Society, Ontario Division and the Ontario Rheumatology Association is continuing to carry out research with the goal of reducing the impact of arthritis on individuals, their families, and the population. As part of our work to document the gaps and needs in services to people with arthritis enclosed is a brief questionnaire on practice patterns and clinic locations of all rheumatologists in the province.

The data collected will be used to develop an up-to-date picture of rheumatology services across Ontario so that gaps in services may be identified. As results may have potential implications for the future planning of health services in Ontario, your response to this questionnaire is very important to us.

We appreciate that your time is valuable. For this reason, the questionnaire includes only the most essential questions and should take you no more than a few minutes to complete. All information gathered will be held in *strict confidence* and will be stored in a locked filing cabinet accessible only to the researchers in this study. You will not be identified in any publication resulting from this research. If you wish, a copy of the study's findings will be made available to you.

There are no expected risks to your involvement in this study. Although your participation in this study may not benefit you directly as an individual, it is anticipated that your contributions will have an impact on the planning and delivery of health care services for persons in Ontario.

We would greatly appreciate if you could complete this questionnaire and return it promptly to the attention of Paula Veinot, Study Coordinator, at our **FAX** number **416-603-6288**. If you have any questions or comments regarding this survey, please contact Paula Veinot at 416-603-5800 ext. 2273 or toll free 1-866-724-0003 or by email pveinot@uhnres.utoronto.ca. Once again, thank you for your assistance and support in this very important research endeavour.

Sincerely,

Carter Thorne, MD
Ontario Rheumatology Association

Elizabeth Badley, PhD
Director, ACREU

Appendix B. Self-Administered Survey Questionnaire

Arthritis Community Research and Evaluation Unit

Ontario Survey of Rheumatologists

(September 2007)

Rheumatologist ID #:

Please complete this questionnaire and return it to: *Paula Veinot,* Fax #: *416-603-6288.* Unless otherwise specified, please mark the correct response box for each question.

A. Background Information

1a. Are you currently practising clinical medicine?

1 Yes

2 No - on temporary leave (e.g., sabbatical)

Please indicate duration: _____

3 No - not at all (e.g., retired, research only)

1b. Do you have an office practice with rheumatology patients?

1 Yes 2 No

If you responded "No - not at all" to Question 1 (either a or b), please *do not* complete this questionnaire, but return it to the above fax number. Otherwise, please proceed with the following questions.

B. Geographic Distribution

2. Where is your *major* rheumatology practice located?

_____ City/Town

_____ Postal Code

3a. Please indicate the location (community) of *all rheumatology clinics, including outreach clinics,* in which you participate. For each, indicate the amount of time you devote to each clinic.

Please indicate the locations of your office or clinic sessions. Name **city or town where they are located**.	Please indicate the number of **hours per week** devoted to **office time**	What is the **average** waiting time for a **new** patient to be seen in your clinic? ***Please indicate the number of weeks for a:***	
		non-urgent ambulatory patient	**patient with likely inflammatory arthritis**
1. _____ City/Town _____ Postal Code	_____ **hours per week** _____ hours per month _____ hours per year	_____ weeks	_____ weeks
2. _____ City/Town _____ Postal Code	_____ **hours per week** _____ hours per month _____ hours per year	_____ weeks	_____ weeks
3. _____ City/Town _____ Postal Code	_____ **hours per week** _____ hours per month _____ hours per year	_____ weeks	_____ weeks

3b. If there is an urgent referral, can you see a patient within a week?

1 Yes, all of the time
2 Yes, most of the time
3 Yes, occasionally
4 Yes, rarely
5 Never

C. Practice Patterns

4. What proportion of your practice is:

Adult patients? _____% Paediatric patients (18 years or less)? _____%

5a. Do you have a special interest or subspecialty (more than 50% of patients)?

1 Yes 2 No

5b. If **Yes**, do you have a special interest or subspecialty in:

1 Lupus
2 Osteoarthritis
3 Rheumatoid Arthritis
4 Vasculitis
5 Osteoporosis
6 Juvenile Arthritis
7 Fibromyalgia
8 Spondyloathropathy
9 Other (Please specify): _____

6a. Compared with 3 years ago, which option best describes the volume of your rheumatology practice?

1 The volume of my practice is **increasing**
2 The volume of my practice is **decreasing**
3 The volume of my practice has **not changed**/stable volumes
4 Other, please explain _____

6b. Have there been changes to the pattern of your practice in the last 3 years?

1 Yes 2 No

6c. If Yes, have you increased or decreased in the following areas:

1) Emergency (Hospital):
☐1 Not applicable ☐2 Increased ☐3 Decreased ☐4 No change

2) General internal medicine:
☐1 Not applicable ☐2 Increased ☐3 Decreased ☐4 No change

3) Medico-legal:
☐1 Not applicable ☐2 Increased ☐3 Decreased ☐4 No change

4) Independent medical services (e.g., third party billing):
☐1 Not applicable ☐2 Increased ☐3 Decreased ☐4 No change

5) Pharmaceutical company (e.g., participation in clinical trials):
☐1 Not applicable ☐2 Increased ☐3 Decreased ☐4 No change

6) Other, please specify_____
☐1 Not applicable ☐2 Increased ☐3 Decreased ☐4 No change

7. Do you see general medicine patients in your office?

1 Yes _____% of patients 2 No

8. Do you have difficulties scheduling your patients for routine follow-up because of your caseload?

1 Yes 2 No

9. Please rank the following *barriers to service factors that impede your ability to practise rheumatology as you would like to practise* by their importance. Rank only those that apply to your practice:

[ ]1 Lack of or delayed referrals by GPs

[ ]2 Inappropriate or incomplete referrals by GPs

[ ]3 Lack of timely information (e.g., x-rays, blood work)

[ ]4 Long waiting times

[ ]5 Billing policies/regulations for consultation and follow-up visits

[ ]6 Lack of access to allied health professionals

[ ]7 No access to hospital beds

[ ]8 Financial barriers such as affordability of drugs to patients

[ ]9 Other, please specify_____

[ ]10 None

10. In your opinion, is it possible to make ends meet from rheumatology practice alone (without resorting to third party billing, pharmaceutical trials, internal medicine patients, etc.)?

1 Yes, easily

2 Yes, with some difficulty

3 Yes, with a lot of difficulty

4 No, not possible

5 No opinion

11. There are a number of new emerging paradigms for arthritis care. Are you involved in any of the following? *Please check all that apply:*

1 Early arthritis clinic for rheumatology patients

2 Comprehensive team care/Coordinated care program that involves other allied health professionals (e.g., physiotherapists, occupational therapists, social workers)

3 Telemedicine

4 Other - please specify _____

D. Care for Patients with Inflammatory Arthritis

If you do not see inflammatory arthritis patients please check here ☐$_1$ - Go to Section E

12a. **What proportion of patients seen in the *last month* have inflammatory arthritis or autoimmune disease?**

_____%

12b. **Has this proportion changed in the *past year*?**

$_1$ Increased
$_2$ Decreased
$_3$ Remained the same

12c. **What proportion of your inflammatory caseload is referred to you *within 3 months* of symptom onset?**

_____%

12d. **What proportion of your patients with inflammatory arthritis receive biologics?**

$_1$ Less than 20%
$_2$ 20 - 50%
$_3$ More than 50%
$_4$ Do not prescribe biologics

12e. **Has this proportion changed in the *past year*?**

$_1$ Increased
$_2$ Decreased
$_3$ Remained the same

12f. **What proportion of your patients with inflammatory arthritis receive combination DMARD therapy?**

$_1$ Less than 20%
$_2$ 20 - 50%
$_3$ More than 50%
$_4$ Do not prescribe combination DMARD therapy

12g. **Has this proportion changed in the *past year*?**

$_1$ Increased
$_2$ Decreased
$_3$ Remained the same

12h. **Do you supervise an infusion clinic?**

$_1$ Yes $_2$ No

E. Management of Patients in Your Office

13. Please indicate in the following table the services available to patients in your *primary* rheumatology practice. *(Please mark the appropriate boxes with an X)*

Services for patients	Are the following services available to your patients$_1$	Do you refer/ recommend patients to the following?$_2$	Are the wait times appropriate?$_3$
1.Occupational Therapy	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
2. Physiotherapy	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
3. Social worker	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
4. Dietician	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
5. Orthopaedic Surgeon for total joint replacement (TJR)	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
6. Orthopaedic surgeon for other surgery	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
7. Orthotics	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
8. Hydrotherapy (community and therapeutic pools)	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
9. Community exercise programs	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
10. The Arthritis Society for therapy/assessment	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
11. The Arthritis Society for education	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
12. The Arthritis Society for arthritis self-management	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know
13. Other, please specify _____	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know	☐$_1$ Yes _____% of patients ☐$_2$ No	☐$_1$ Yes ☐$_2$ No ☐$_3$ Don't know

F. Your Practice as a Rheumatologist

14. Do you have any clinical responsibilities in addition to seeing rheumatology outpatients? *(Please mark all that apply)*

$_1$ Hospital emergency room rotation

$_2$ In-hospital internal medicine ward

$_3$ Internal medicine out-patient clinic

$_4$ After hours on-call responsibilities for rheumatology

$_5$ After hours on-call responsibilities <u>other than</u> rheumatology services

$_6$ On-call hours for general internal medicine

$_7$ Other, please specify

_____

15. Please indicate whether you are involved in any administrative work, teaching or research and give the proportion of your time currently committed to each.

1 Clinical practice _____ %

2 Administration _____ %

3 Teaching _____ %

4 Research _____ %

16. Do you have a University faculty appointment?

1 Yes, geographic full-time

2 Yes, geographic part-time

3 Yes, clinical associate appointment

4 Yes, other - please specify _____

5 No

17a. Do you have a hospital appointment?

1 Yes 2 No

17b. If *Yes* - Do you act as "Most Responsible Physician" (MRP) in your local hospital?

1 Yes 2 No

18a. Years in practice as a rheumatologist: _____ years

18b. Year of completion of rheumatology training: _____/_____/_____

Year Day Month

18c. Expected year of retirement:

1 Less than 5 years

2 5-10 years

3 More than 10 years

4 Don't know

18d. Sex: 1 Male 2 Female

18e. Year of birth: 19_____

This completes all of our questions. *Thank-you very much* for your help with this study. We appreciate that your time is valuable. If you are interested in a copy of the study results, please call us at *(416) 603-6269*.

Please return this questionnaire by *FAX (416) 603-6288* to:

Arthritis Community Research and Evaluation Unit, *Attention*: Paula Veinot, Toronto Western Hospital, 399 Bathurst Street - MP10-326, Toronto, ON, M5T 2S8

Appendix C. Reminder Letter

Date

Dr. XXXX
Address

Re: Ontario Survey of Rheumatologists of Ontario, 2007 – Reminder Letter

Dear Dr. XXXX,

A couple weeks ago you should have received a brief questionnaire on clinic locations and practice patterns of rheumatologists in Ontario. This survey is being conducted by The Arthritis Community Research and Evaluation Unit (ACREU), in partnership with the Arthritis Society, Ontario Division and the Ontario Rheumatology Association. The data collected will be used to develop an up-to-date picture of rheumatology services across Ontario.

Your response to this questionnaire is very important and may contribute to the planning and delivery of health care services in Ontario. It should take only a few minutes of your time. For your convenience, I have included another copy of the questionnaire. We would greatly appreciate if you could complete this questionnaire and return it promptly to the attention of Paula Veinot, Study Coordinator, at our **FAX** number **416-603-6288**. If you have any questions or comments regarding this survey, please contact Paula Veinot at 416-603-5800 ext. 2273 or toll free 1-866-724-0003 or by email pveinot@uhnres.utoronto.ca. If you have already returned your completed questionnaire, thank you.

Sincerely,

Carter Thorne, MD
Ontario Rheumatology Association

Elizabeth Badley, PhD
Director, ACREU

Appendix D. Telephone Script

Telephone contact is to be made with the Administrative Staff two weeks following the reminder letter.

Script

A couple weeks ago Dr. XXXX should have received a brief questionnaire on clinic locations and practice patterns of rheumatologists in Ontario. This survey is being conducted by The Arthritis Community Research and Evaluation Unit (ACREU), in partnership with the Arthritis Society, Ontario Division, and the Ontario Rheumatology Association. The data collected will be used to develop an up-to-date picture of rheumatology services across Ontario.

To date we have not received a response from Dr. XXXX. His/Her response to this questionnaire is very important and may contribute to the planning and delivery of health care services in Ontario. It should take only a few minutes of his/her time.

*We would greatly appreciate if you could remind him/her to complete this questionnaire and return it promptly to the attention of Paula Veinot, Study Coordinator, at our **FAX** number **416-603-6288**. If he/she has any questions or comments regarding this survey, please contact Paula at 416-603-5800 ext. 2273 or toll free 1-866-724-0003 or by email pveinot@uhnres.utoronto.ca .*

Appendix E. Email Reminder

Dear Dr. XXXX,

Within the past few months you were mailed a brief questionnaire from the Arthritis Community Research and Evaluation Unit (ACREU) in partnership with The Arthritis Society, Ontario Division, the Ontario Ministry of Health and Long-Term Care and the Ontario Rheumatology Association (ORA). The questionnaire asks about practice patterns and clinic locations to develop an up-to-date picture of rheumatology services across Ontario so that gaps in services may be identified.

I appreciate that your time is valuable. However, your participation in this study may have an impact on the future planning and delivery of health care services for persons in Ontario, in particular rheumatology. I would greatly appreciate if you could complete the questionnaire (attached to this email) by **January 18, 2008**. Please return it to Paula Veinot, Study Coordinator, FAX number 416-603-6288.

If you have any questions or comments regarding this survey, please email me at cartho@rogers.com or contact Paula Veinot at 416-603-5850 or toll free 1-866-724-0003 or by email pveinot@uhnres.utoronto.ca.

Thank you for your support in this very important research endeavour.

Sincerely,

Carter Thorne, MD
Ontario Rheumatology Association

Appendix F. Ontario Map of Local Health Integration Network (LHIN) Boundaries