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# Assessing the impact of a nursing model of care on rheumatology practice patterns and patient satisfaction in British Columbia

Study results from three clinics indicate a significant increase in outpatient encounters and high levels of patient satisfaction after implementation of a rheumatology multidisciplinary care assessment billing code.

ABSTRACT

***Background:*** Timely access to care and control of disease activity in inflammatory arthritis is crucial to maintain patient quality of life and prevent joint damage and loss of function. In 2010 BC faced a shortage of rheumatologists caused in part by disparities between rheumatology and other subspecialties. To address the resulting service shortages, rheumatologists in BC explored multidisciplinary patient care approaches, including a new fee-for-service code that allows nurses to provide education and counseling to patients concerning medication, diet, and exercise. The nursing model of outpatient rheumatology care that resulted has changed the practice patterns of BC rheumatologists. A study was proposed to explore how patient access to rheumatology care has changed since the implementation of the Multidisciplinary Conference billing code G31060 (as of 1 April 2020 called the Multidisciplinary Care Assessment billing code) and how acceptable this model of care is to patients.

***Methods:*** In 2018 a review of electronic medical records was conducted in three rheumatology clinics in British Columbia to measure changes in the number of outpatient encounters before and after the implementation of a nursing model of care. Data from the records were used to generate descriptive statistics. RCPSC-certified rheumatologists in BC were asked to respond to a survey about practice patterns. Patients were asked to respond to a survey about six aspects of care: general satisfaction, giving of information, empathy with the patient, technical quality and competence, attitude toward the patient, and access and continuity. A literature review was completed to identify studies of physician-led care in similar patient populations.

***Results:*** The mean number of weekly outpatient encounters per rheumatologist for all inflammatory diseases was 17.4 patients per week in 2009 and 30.4 patients per week in 2016, an increase of 74.7% (13 patients per rheumatologist per week). When encounters were considered by diagnosis, there was a mean increase of 84.0% for diffuse diseases of connective tissue (3.8 patients per rheumatologist per week), 56.9% for rheumatoid arthritis (4.6 patients), 118.3% for ankylosing spondylitis (2.4 patients), and 75.3% for psoriatic arthritis (2.2 patients). Survey results for patient satisfaction show the care was highly acceptable, with a mean overall patient score of 4.35 out of 5.00. Survey results for rheumatologist practice patterns show an increase in the use of nursing support, with only 23% having access to nursing support in 2010 and 71% having access after implementation of the billing code.

***Conclusions:*** More outpatient encounters for all disease types were seen at all three participating rheumatology clinics after implementation of the billing code. Rheumatologists received increased remuneration and had time to see more patients while nurses assisted with patient assessments and educated patients about medications, diet, and exercise. Patient satisfaction scores for six aspects of care were all higher than 4.00 out of 5.00.

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## Background

Rheumatologists are internal medicine subspecialists who care for patients with systemic autoimmune diseases such as rheumatoid arthritis, lupus, vasculitis, and inflammatory diseases of the back. In addition, rheumatologists care for patients with complicated musculoskeletal problems such as advanced osteoarthritis, injuries, and tendinopathies. Public Health Agency of Canada data indicate that the burden of rheumatic diseases is increasing.[1]

In BC rheumatologic care is primarily delivered in an outpatient private practice clinic setting. The patients seen in a rheumatologist's clinic suffer from some of the most complicated diseases in medicine. Disorders in rheumatology strike multiple organ systems, including the joints, heart, skin, muscle, lungs, and kidneys. The rheumatologist is often a coordinator of care for patients with complicated disease who require a holistic, multidisciplinary approach to their multiorgan pathology.

Timely access to care and control of disease activity in inflammatory arthritis is crucial to prevent joint damage and loss of function and to maintain quality of life. Joint damage can occur within 3 months of disease and lead to disability. Research has shown that intervention with disease-modifying antirheumatic drug (DMARD) therapy will help patients with inflammatory arthritis achieve disease remission, improve physical function, and prevent long-term disability. Previous studies in BC have shown that only 39% of the early incident rheumatoid arthritis population and 45% of the prevalent late rheumatoid arthritis population were receiving DMARD therapy, suggesting the existence of large service gaps.[2,3]

In 2010 BC was faced with a shortage of rheumatologists. Recruitment and retention pressures, caused in part by disparities between rheumatology and other subspecialties, had resulted in poor access to care for BC residents with rheumatic diseases. At that time, there were only 32 full-time equivalent (FTE) rheumatologists in the province, or one rheumatologist for every 140 000 residents.[4] Guidelines recommend a rheumatologist-to-patient ratio of 1:70 000, which meant that the BC population was underserviced by approximately 32 FTEs. In addition, 33% of rheumatologists reported that wait times for nonurgent consults were longer than 4 months, suggesting that the shortage of rheumatologists was having an impact on patient outcomes.[4]

To address these service shortages, rheumatologists in BC explored patient care approaches through the Specialist Services Committee (SSC). This eventually led to the introduction of a Multidisciplinary Conference billing code G31060 (as of 1 April 2020 called the Multidisciplinary Care Assessment billing code) that allowed for nursing support in outpatient rheumatology care.

The new billing code allows patients with complex inflammatory disease to receive personalized counseling and education from rheumatology nurses, including education about medications, diet, immunization, and exercise, training in self-injection of rheumatologic agents, and counseling for DMARD therapy.[5] This support from nurses in the management of patients frees up more physician time and allows for more care to be delivered in fewer encounters, thus reducing the number of visits to other health care professionals.

**The new billing code allows patients with complex inflammatory disease to receive personalized counseling and education from rheumatology nurses.**

Since the billing code was introduced, there has been a dramatic shift in the delivery of rheumatology care for outpatients in BC. A specialty nursing group has been established, BC Rheumatology Nurses, and rheumatologists throughout the province have engaged nurses in their clinics part-time and full-time.

The introduction of multidisciplinary teams that include rheumatology nurses has changed the practice patterns of BC rheumatologists and has potentially changed patient access to care. Because access to care is a quality indicator, the changes made have the potential to alter the quality or acceptability of care for patients.[6] A study was proposed to explore how patient access (the number of rheumatology patients seen in a period of time by an individual rheumatologist) has changed since the implementation of the billing code and how acceptable this model of care is to patients.

## Methods

An electronic medical record (EMR) review was conducted in the summer of 2018 to measure changes in the number of patient visits in three urban rheumatology clinics in Vancouver and Victoria.

Each rheumatology clinic was run by a single specialist, was using the same EMR system, and was operating both before and after implementation of the billing code in 2010. The total number of distinct patients seen per year was measured for 2009 and for 2016 to allow for a 6-year period of adjustment after the billing code was implemented. Each patient was counted only once in a year, regardless of the number of visits to the clinic, to determine if more individual patients were being seen with the change in the model of care as opposed to the same patient being seen more often. The number of days the clinic's rheumatologist worked that year were taken into account, and the encounters were stratified by inflammatory disease type (connective tissue diseases, rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis).

Additional data were obtained from 2010 and 2018 surveys by the BC Society of Rheumatologists. Each online, self-administered survey consisted of questions on demographics and practice patterns. The surveys were sent out to all RCPSC-certified rheumatologists in BC. The response rate for 2010 was 98% (n = 45) and for 2018 was 91% (n = 77). These data were supplemented with billing information provided by the BC Medical Services Plan (MSP), the sole insurer for rheumatology services in the region.

Data on patient satisfaction were collected using the Leeds Satisfaction Questionnaire (LSQ), a validated and reliable tool for assessing care in rheumatology outpatient clinics.[7]

Patients were asked to consider 45 statements and use a Likert scale to rate six aspects of their rheumatology care: general satisfaction, giving of information, empathy with the patient, technical quality and competence, attitude toward the patient, and access and continuity. The LSQ was administered in English to outpatients with inflammatory disease 19 years and older who were attending a follow-up appointment and were able to complete the survey on their own. The questionnaire was completed in the waiting room before the appointment to ensure the responses were not biased by the most recent interaction or by acquiescence bias resulting from the presence of the rheumatologist.

The completed questionnaires were sealed in envelopes and patients were assured they would remain anonymous and their responses would not be viewed by the treating rheumatologist. Questionnaires were collected in two of the three rheumatology clinics studied. Means from the responses were pooled and compared with values from studies identified in a literature review as having similar patient populations but more traditional physician-led service delivery methods.[8,9]

Descriptive statistics were calculated during data analysis. As this was an exploratory health services study, the patient access measure was not powered to allow for statistical comparisons between physicians. The study was done as part of an evaluation of labor market adjustment (LMA) fees. Funding for the evaluation was provided by the Specialist Services Committee, a joint collaborative committee of Doctors of BC and the BC Ministry of Health. Ethics approval for the study was obtained from the University of British Columbia Behavioural Research Ethics Board.

## Results

In 2009, before implementation of the billing code for rheumatology, 1493 patient encounters occurred over 439 working days. In 2016, after implementation, 2761 patient encounters occurred over 463 working days. The mean number of weekly outpatient encounters per rheumatologist for all inflammatory diseases was 17.4 patients per week in 2009 and 30.4 patients per week in 2016, an increase of 74.7% (13 patients per rheumatologist per week) **[Figure 1]**.

**The mean overall satisfaction score was 4.35 out of 5.00.**

When encounters were considered by diagnosis, there was a mean increase of 84.0% for diffuse diseases of connective tissue (3.8 patients per rheumatologist per week), 56.9% for rheumatoid arthritis (4.6 patients), 118.3% for ankylosing spondylitis (2.4 patients), and 75.3% for psoriatic arthritis (2.2 patients) **[Figure 2]**.

The Leeds Satisfaction Questionnaire was completed by 92 patients at two of the three rheumatology clinics studied. The mean overall satisfaction score was 4.35 out of 5.00 and all aspects of care received ratings higher than 4.00. When these results were compared with results from studies in Alberta and Norway, the scores in British Columbia were found to be equal or significantly higher **[Table]**.

Only 23% of rheumatologists in 2010 had access to nursing support as part of their practice, but that number increased to 71% in 2018, after implementation of the billing code **[Figure 3]**. From 2011 to 2018, the use of the code across BC increased by 234%. Billings per rheumatologist went from 140 in the 2011/12 fiscal year (the first year after code G31060 was implemented) to 467 billings in the 2017/18 fiscal year (written communication with Raaj Tiagi, senior health economist, Doctors of BC, 16 January 2019) **[Figure 4]**. As of 2018, 22 FTE nurses were employed in rheumatology community outpatient clinics in BC, compared with only one nurse in 2010.

## Conclusions

The number of outpatient encounters is a vital metric when determining accessibility of care for rheumatology patients. Increases in patient visits were seen for all three rheumatology clinics studied and for all disease types after implementation of the billing code. This suggests that rheumatologists can care for more

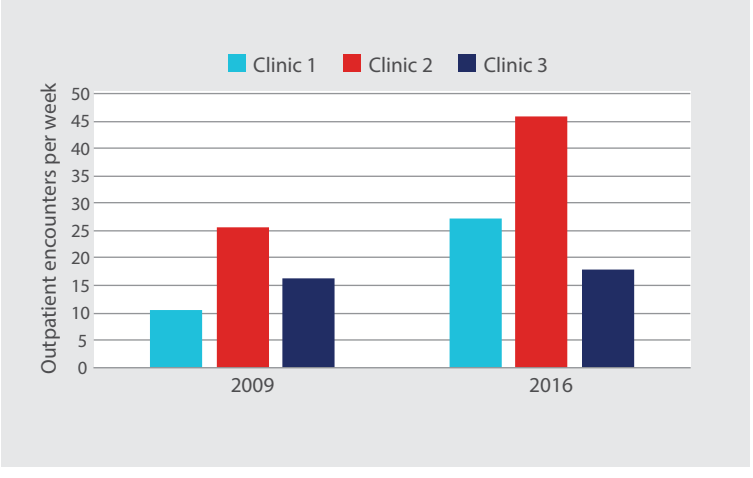


**FIGURE 1.** Number of weekly outpatient encounters by rheumatologist at three BC clinics in 2009 (before implementation of billing code G31060) and in 2016 (after implementation).

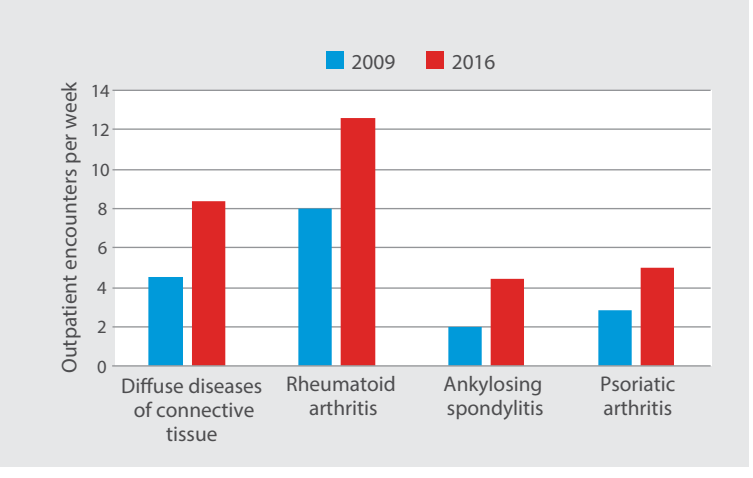


**FIGURE 2.** Number of weekly outpatient encounters by diagnosis at three BC clinics in 2009 (before implementation of billing code G31060) and in 2016 (after implementation).

patients with nursing support than they can without this support.

Rheumatology is a time-intensive specialty with patients having complex histories, requiring detailed physical examinations, and needing information about the expanding field of biologic treatments. The observed increase in patient access is substantial given the complexity of the patients involved. Also, it is important to note that the increase in access at the three rheumatology clinics studied means that joint damage and function loss in those patients with inflammatory conditions was probably prevented.

**TABLE.** Results from Leeds Satisfaction Questionnaire (LSQ) completed in British Columbia, Alberta, and Norway by patients at rheumatology clinics using a multidisciplinary care model.

| LSQ aspects of care | British Columbia, 2018 (95% CI) | Alberta, 2017[9] (95% CI) | Norway, 2013[10] (95% CI) |
|---|---|---|---|
| General satisfaction | 4.26 (4.10, 4.41) | 4.25 (4.10, 4.40) | 4.06 (3.82, 4.30) |
| Giving of information | 4.34 (4.23, 4.45) | 4.2 (4.06, 4.34) | 3.81 (3.29, 4.03) |
| Empathy with the patient | 4.28 (4.17, 4.39) | 4.02 (3.85, 4.19) | 3.83 (3.62, 4.03) |
| Technical quality and competence | 4.59 (4.49, 4.69) | 4.53 (4.40, 4.66) | 4.49 (4.31, 4.68) |
| Attitude toward the patient | 4.42 (4.32, 4.53) | 4.46 (4.30, 4.62) | 4.05 (3.83, 4.27) |
| Access and continuity | 4.21 (4.09, 4.33) | N/A* | 3.40 (3.18, 3.62) |
| Overall satisfaction | 4.35 (4.25, 4.45) | 4.30 (4.17, 4.43) | 3.95 (3.80, 4.11) |
| Ophthalmology | 3 (1–7) | 55 | 310 |
| Plastic surgery | 5 (3–8) | 75 | 189 |
| Radiology | 3 (1–9) | 56 | 84 |
| Immunology | 1 (0–4) | 50 | 70 |

*Results could not be compared because researchers altered the questions for access and continuity.

### Advantages of the nursing model

Studies have shown that nurse-led care in rheumatology is acceptable, safe, and equally effective as physician-led care.[10] A systematic review by Garner and colleagues demonstrates conflicting evidence about the cost-effectiveness of implementing nurse-led care, but most studies suggest that it either costs the same or less than other models of care.

When assessing patient satisfaction with this model, we compared our results with those from two recent studies with similar patient populations, namely traditional physician-led health service delivery methods in Alberta[8] and Norway.[9] The equal and significantly higher scores found in our study suggest greater satisfaction with multidisciplinary care in BC as compared with physician-led care in Alberta and Norway. Any negative impact caused by implementing a nursing model of rheumatology care has not been significant, with all aspects of care scoring more than 4.00 out of 5.00.

Results from the 2018 BC Society of Rheumatologists survey suggest multiple advantages to having additional nursing support in outpatient rheumatology practices. Rheumatologists benefit from increased remuneration and from having time to see more patients while nurses assist with patient assessments and educate patients about medications, diet, and other aspects of care.

Recommendations from the European League against Rheumatism (EULAR) state that patients should have access to nursing support for education purposes. The league also concluded that statistically significant higher levels of knowledge were found in patients with access to nursing support compared with those seen only by rheumatologists.[11,12] In addition, the recommendations state that the participation of nurses can help control disease activity and improve patient-preferred outcomes.[6]

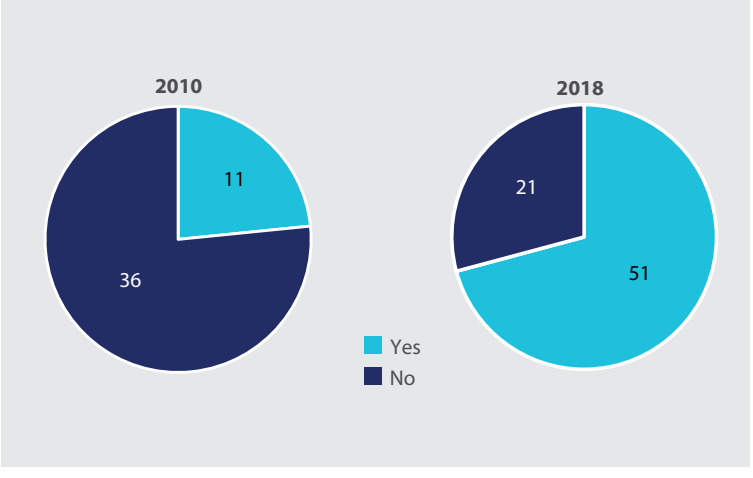


**FIGURE 3.** BC rheumatologists with access to nursing support for care of outpatients in 2010 (before implementation of billing code G31060) and in 2018 (after implementation).

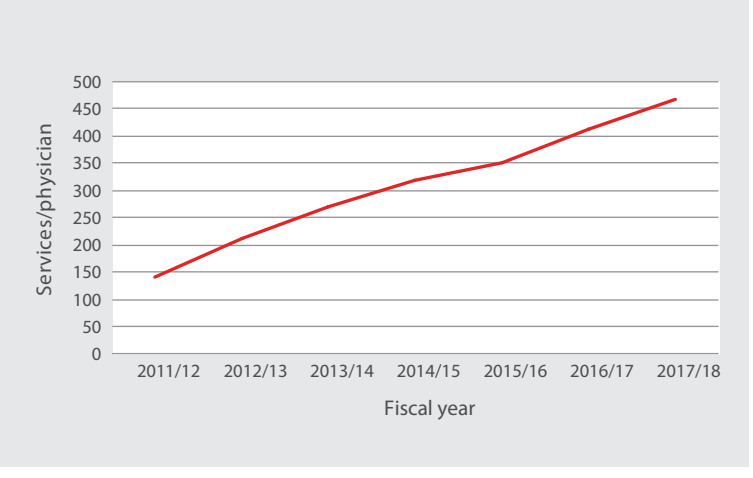


**FIGURE 4.** Use of code G31060 billings per rheumatologist by fiscal year, 2011–2018.

### Study limitations

The results of our study have limited generalizability to rural and remote communities as the three participating clinics were all in urban centres. In addition, demographic shifts and other changes in the BC health system that were not measured may have had an impact on the change in patient visits over time. Regarding results from the Leeds Satisfaction Questionnaire, information was not collected on demographics or disease progression, so confounding variables could not be accurately analyzed to determine their effect on acceptability of care. Regarding the studies used for comparing patient satisfaction, there were two issues. First, the Norway study had a different time frame as compared to the Alberta and British Columbia studies. Second, a control clinic with rheumatologist-only care could not be found in BC because all clinics approached to participate were already using nurses in some capacity, and a control clinic serving patients with noninflammatory disease would be inappropriate since patient satisfaction is known to vary by disease type. In future, comparisons might be made in other provinces where nursing care is not common in rheumatology clinics.

**As of 2018, 22 FTE nurses were employed in rheumatology community outpatient clinics in BC, compared with only one nurse in 2010.**

### Summary

Implementation of the rheumatology billing code G31060 in BC has been associated with a significant increase in outpatient encounters for individual physicians managing patients with inflammatory disease. Implementation has also been associated with high levels of patient satisfaction. Our findings indicate nursing support has become an acceptable and integral part of outpatient rheumatology care provincially, and has the potential to improve service delivery and quality of care. ■

**Competing interests**

None declared.

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