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Online Supplementary Data 2

2014 Update on the Canadian Rheumatology Association/Spondyloarthritis Research Consortium of Canada Treatment Recommendations for the Management of Spondyloarthritis

Part I: Principles of the Management of Spondyloarthritis in Canada

Sherry Rohekar, Jon Chan, Shirley M.L. Tse, Nigil Haroon, Vinod Chandran, Louis Bessette, Dianne Mosher, Cathy Flanagan, Kevin Keen, Karen Adams, Michael Mallinson, Carter Thorne, Proton Rahman, Dafna Gladman, and Robert D. Inman

Spondyloarthritis (SpA) includes several inflammatory conditions affecting both axial and peripheral joints. The most common subsets of SpA include ankylosing spondylitis (AS) and psoriatic arthritis (PsA), which together have a high prevalence and significant burden of illness in the Canadian population. Patients with SpA are typically young and encounter long delays in diagnosis, followed by longterm medical management.

The management of SpA is complex. The Spondyloarthritis Research Consortium of Canada (SPARCC) has partnered with the Canadian Rheumatology Association (CRA) to create treatment recommendations for the management of SpA. Initial recommendations were published in 2003 and subsequently updated in 2007[1, 2]. These publications set a new benchmark for the development and dissemination of treatment recommendations, with active involvement of multiple stakeholders including physicians, allied health professionals, ethicists, and patients.

Since 2007, there has been a continued and rapid evolution in the diagnosis, management, and monitoring of SpA. The role of traditional disease-modifying antirheumatic drugs in the treatment of axial SpA (axSpA) has become tenuous[3-6]. Conversely, new evidence has established that nonsteroidal antiinflammatories (NSAID) may have a disease-modifying effect[7-9]. The potential for tumour necrosis factor inhibitors (TNFi) to prevent progression of axial disease has been presented[10]. New biologic agents have emerged upon the Canadian market, and their role in SpA has not yet been formally addressed. Magnetic resonance imaging (MRI) has emerged as a key diagnostic tool for the diagnosis of axSpA, particularly nonradiographic axSpA (nr-axSpA)[11-14]. Owing to ongoing limitations that many clinicians face in accessing MRI for their SpA patients in a timely manner, it is appropriate that CRA/SPARCC addresses MRI wait times, which was not done in 2007.

Additionally, the 2007 recommendations did not address management of juvenile spondyloarthritis (JSpA). Though the clinical presentation of SpA in children is frequently different from adults, all patients with SpA are known to share common genetic predispositions. It has been suggested that JSpA and adult SpA represent a continuum of disease[15]. For this reason, it is essential, that the management of JSpA be included in the 2014 Update.

To address the rapid changes in SpA management, CRA/SPARCC presents its 2014 Update on the CRA/SPARCC Treatment Recommendations for the Management of Spondyloarthritis. The aim of these recommendations are to inform best practices of the Canadian rheumatology community, including rheumatologists, primary care physicians, allied health professionals, patients, and policy makers.

For clarity, these recommendations have been divided into 2 parts: Part I: Principles of the Management of SpA, and Part II: Specific Management Recommendations. Part I addresses optimal SpA management as well as barriers to implementation of these recommendations. This is largely derived from expert opinion. Part II consists of specific recommendations for SpA treatment and has a larger body of literature support. Recommendations were based upon the highest quality of evidence available at the time the working group undertook this review. They are intended to promote best practices and improve delivery of healthcare for those with SpA. Recommendations, however, should not be interpreted as rigid or legal standards, or are they intended to replace the clinical judgement of rheumatologists and other trained SpA healthcare providers acting according to the individual needs of the patient and the unique clinical circumstance.

MATERIALS AND METHODS

Participants

The 2014 Update on the CRA/SPARCC Treatment Recommendations for the Management of Spondyloarthritis was undertaken using a systemic approach with broad stakeholder input. The CRA/SPARCC Treatment Recommendations working group was composed of the SPARCC executive committee, rheumatologist leaders from SPARCC collaborating sites, Canadian rheumatologists from across the country with a special interest in SpA (representing both community and academic centers), epidemiologists/health services researchers, members of the CRA Executive and Therapeutics Committee, and a patient representative from the Canadian Spondylitis Association. Pharmaceutical or industry representatives were not involved in the development of the 2014 Update in any way.

Patient Population

These treatment recommendations are intended to be applied to both axial and peripheral SpA. axSpA includes nr-axSpA, which is defined as axSpA that is diagnosed on the basis of MRI findings at the sacroiliac (SI) joints and/or spine and lack of diagnostic ─ radiographic evidence of sacroiliitis as per ASAS criteria[16,17]. Peripheral SpA is diagnosed as per ASAS criteria; accordingly, axial involvement is not required[18]. Psoriatic arthritis is included as a form of SpA, and may be predominantly axial or predominantly peripheral in terms of its clinical presentation. The definition of the patient population is illustrated in Figure 1.

Spondyloarthritis in children, referred to as JSpA, more commonly presents as undifferentiated disease and is commonly referred to as enthesitis-related-arthritis (ERA) under the International League of Associations for Rheumatology classification criteria for juvenile idiopathic arthritis (JIA). Consequently, the target population in children will focus and be referred to as JSpA(ERA). In contrast to adults, children are more likely to have peripheral arthritis and enthesitis rather than axial involvement at disease onset.

Spinal involvement is uncommon early in the disease course but axial involvement of the SI joints is possible and generally becomes more clinically evident as the child ages.

Of note, these recommendations are intended as management recommendations only, and are not intended to be used for the diagnosis of SpA. We recommend that SpA diagnosis be made on the basis of the physician's clinical judgement. Classification criteria for axial and peripheral SpA have been previously proposed by ASAS, and the CASPAR criteria may be used for PsA specifically[17-19].

Scope

Several broad areas have been addressed in this Update of the CRA/SPARCC Treatment Recommendations. The 2007 Update addressed general management principles, ethical considerations, target groups for treatment recommendations, definition of target disease, and disease monitoring in addition to specific management recommendations. In the 2014 Update, the working group chose to remove the recommendations addressing the definition of target disease. It was felt that this section imposed upon the realm of diagnostic or classification criteria rather than treatment. The 2014 Update also introduced a new area: wait time recommendations, specifically detailing time from referral to assessment by a rheumatologist and access to diagnostic imaging. The 2014 Update also uniquely introduces modifications of the adult treatment recommendations that may be applied to the management of JSpA(ERA).

Development Process

The need to update the 2007 CRA/SPARCC Treatment Recommendations was identified in late 2012. One of the authors (SR) then went on to review the 2007 document and identify issues requiring further discussion and literature review. These issues were then discussed in late January 2013 during a teleconference of the SPARCC Executive Committee. This allowed for the formulation of the first draft of Treatment Recommendations.

In April 2013, members of the working group received a web-based survey in which they were asked to evaluate items that had not appeared in the 2007 recommendations. Each member was asked to rate the new or modified proposed guideline on a 5-point Likert scale, ranging from "disagree completely" to "agree completely". Twelve of 14 participants responded to this survey (response rate 86%).

The results of the survey were then discussed in detail at the SPARCC Investigators' Meeting in 2013. This allowed for in-depth discussion of the individual treatment recommendations with wide stakeholder input. The discussion from the SPARCC Investigators' Meeting was used to develop a second draft of the Treatment Recommendations.

The second draft was then reviewed by the SPARCC Executive Committee in June, leading to a third draft which was disseminated to the entire working group in July 2013.

From July 2013–January 2014, the literature review was updated by 2 authors (SR, JC). The draft recommendations were composed.

In January 2014, after the draft recommendations were completed, the working group was asked to vote by a web-based survey, on each recommendation, again on a 5-point Likert scale ranging from

"disagree completely" to agree completely". Thirteen of 13 participants responded to this survey (response rate 100%). These scores were used to comprise an "Expert Opinion" (EO) rating which was added to the recommendations.

Evidence-based Literature Review

Figure 2 illustrates the initial literature review, completed in April 2013, which was used to inform the draft recommendations.

Appendix A contains the MeSH search terms for the subsequent detailed literature review, which included MEDLINE (OVID) and Pubmed. A recommendation-specific literature search involving the aforementioned search tools was then utilized to identify evidence for each specific recommendation. These searches were conducted as the recommendations were being written to ensure inclusion of the most up to date data. Two authors (SR, JC) reviewed the literature independently to ensure completeness.

Grading Evidence

To maintain consistency with the recent CRA Recommendations for Pharmacological Management of Rheumatoid Arthritis (RA), it was decided to assign the reviewed literature levels of evidence using a simplified version of the Scottish Intercollegiate Guideline Network (Table 1)[20, 21].

Extended Review

After the recommendations were drafted, they were reviewed by the CRA Therapeutics Committee March–April 2014. A need for extended review by the CRA membership was identified. Members and emeritus members of the CRA were sent an electronic survey in which they were asked to provide input on recommendations identified as controversial or having only expert opinion support. Feedback from survey respondents (n = 136, response rate 35%) was used to finalize recommendations and discussion.

RESULTS

The CRA/SPARCC Principles for the Management of SpA encompass general management principles, ethical considerations, target groups for treatment recommendations, and wait time recommendations. These are summarized in Table 2. These management principles may also be applied to JSpA(ERA) through a series of modifications, summarized in Table 3. The level of evidence (LOE), strength of recommendation (SOR), and EO score are listed for each recommendation specifically. Barriers to the implementation of the individual recommendations are also described. These address some elements of the Canadian healthcare system factors that may affect the applicability of the recommendations.

General Management Principles

This section defines the scope and goals of the treatment recommendations. Recommendation 1 establishes the target disease as axial and peripheral SpA, and establishes terminology for the recommendations. This recommendation is based on expert opinion, and thus has a LOE IV and SOR D.

Barriers to the implementation of this recommendation include the rapid evolution of terminology in SpA and the need for further national discussion of SpA classification. Many provincial formularies do not recognize axial and peripheral SpA as diseases or nr-axSpA as a unique disease subset. In such

circumstances, the indications for the use of some medications refer only to AS and PsA, which may inappropriately classify patients.

Recommendation 2 identifies the goal of treatment as remission or a state of minimal disease activity (MDA) with a treat-to-target approach until these goals are reached. An international panel of experts conducted an extensive literature review of treating axial and peripheral SpA, including PsA, with the goal of developing treat-to-target recommendations[22]. The resulting recommendations defined clinical remission/inactive disease as "the absence of clinical and laboratory evidence of significant inflammatory disease activity"[23]. The recommendations also include a treat-to-target algorithm, modeled after the existing RA algorithm[23]. The expert task force employed a Delphi-like process to create their recommendations[23]. These treatment recommendations were largely based on expert consensus opinion rather than clinical studies, leading to a low LOE of IV and SOR D.

A separate, clinically validated MDA definition does exist for PsA in isolation from SpA in general[24,25]. Here, patients are classified as achieving MDA if they fulfilled 5 out of 7 outcome measures: tender joint count ≤ 1; swollen joint count ≤ 1; psoriasis activity and severity index ≤ 1 or body surface area $\leq 3\%$; patient pain visual analog score (VAS) score of ≤ 15; patient global activity VAS score of ≤ 20; Health Assessment Questionnaire (HAQ) score ≤ 0.5; and tender entheseal points ≤ 1[24]. The validation study was based on randomized controlled trial (RCT) subgroup/post-hoc analyses (LOE II, SOR B). A RCT called TICOPA, of intensive care versus standard treatment of PsA is now underway and should further illuminate this area[26].

There are no barriers to the implementation of this recommendation.

The third recommendation in this section advises that the optimal management of SpA include pharmacological and nonpharmacological treatment, as well as patient education. Patient education does have some RCT evidence (LOE I, SOR A). A 4-day educational program improved knowledge and spinal metrology in patients with AS receiving TNFi[27]. Behavioural-educational intervention improved function and VAS scores for cervical and lumbar pain for up to 6 months[28]. Patients with PsA were included in a RCT of educational intervention in inflammatory arthritis and had better global well-being and self-efficacy than controls[29]. Patient education has RCT evidence in both axial and peripheral SpA, but it should be noted that high quality large trials are lacking.

Broad implementation of this recommendation is limited by variable access to nonpharmacological therapies by the Canadian population. Many patient education programs across the country have suffered budget cuts and availability of credentialed educators remains limited. Many patients in geographically remote areas also find it difficult to participate in educational programs.

Recommendations 4–6 are based on the opinions of the CRA/SPARCC Treatment Recommendations working group (LOE IV, SOR D for each). These recommendations address holistic management of SpA, the role of patient preference, pharmaco-economic considerations, and postmarketing evaluation of new SpA therapies.

These recommendations do not have any specific barriers to implementation, but the dearth of evidence suggests additional funding should be allocated to risk-benefit analysis, pharmacoeconomic studies, and postmarketing surveillance.

Ethical Considerations

The bulk of this section is unchanged from the 2007 CRA/SPARCC Treatment Recommendations[2]. For conciseness, 3 recommendations were not repeated in the 2014 Update. It was felt that these 3 statements reflected general ethical obligations of physicians as a whole and were not specifically directed at the management of SpA. Since this section was developed based on expert opinion, it has a low LOE and SOR (IV, D, respectively).

There are no barriers to the implementation of ethical considerations in SpA.

Target Groups for Treatment Recommendations

A notable change from the 2007 Treatment Recommendations are the inclusion of persons with SpA as a target group. These recommendations were developed through expert consensus (LOE IV, SOR D).

There are no identified barriers to the implementation of this recommendation.

Wait Time Recommendations

Wait time recommendations were not addressed in the 2007 Treatment Recommendations[2]. It was felt that this was an important area to address in a Canadian context where delay to appropriate scarce resources such as specialist appointments and imaging likely has a large affect on the management of SpA. The CRA is currently working with the Wait Time Alliance/L'alliance sur les temps d'attente (WTA/ATA) to establish acceptable benchmarks for access to rheumatologists and appropriate diagnostic tests. Currently, the WTA/ATA recommends that "subacute chronic pain in an adult of working age where intervention may improve function" be assessed by a subspecialist after referral by primary physician within 3 months[30]. Routine, scheduled MRI should be performed within 30 days[30].

The wait time recommendations in the 2014 Update focus on axSpA, which is often more difficult to diagnose because of the lack of obvious physical findings. The delay to diagnosis for AS is often a period of years, with varied estimates from 5–10 years[12,31]. Recommendation 13 states that those at highest risk for axSpA (chronic back pain with age of onset ≤ 45) should be assessed by a rheumatologist within 3 months of the referral's initiation. For PsA, there is evidence that a diagnosis after 6 months of symptoms results in worse outcomes; therefore, we recommend that patients be seen as soon possible after referral — usually within 6 weeks[32]. These recommendations are based upon expert opinion (LOE IV, SOR D).

Recommendation 14 focuses on the importance of access to timely MRI to make the diagnosis of nr-axSpA. MRI findings play a prominent role in the current Assessment of Ankylosing Spondylitis (ASAS) classification criteria for axSpA[12,16]. Appropriate imaging sequences should be used[11,13,14]. The LOE and SOR for this recommendation are IV and D, respectively.

Also included is the recommendation that an MRI performed for the diagnosis of SpA should include whole spine and pelvis, with short-tau inversion recovery. During the validation of the ASAS criteria, 5.4% of patients were found to have MRI evidence of inflammation in the spine with sparing of the

SI joint[17]. Imaging only the SI joints may, therefore, miss a proportion of patients. Further, appropriately characterizing the extent of involvement is important. This component of Recommendation 14 has a LOE of II and SOR B.

Unfortunately, there are several barriers to the implementation of this recommendation in the current Canadian context. Access to rheumatologists remains difficult in much of Canada with some provinces having only a handful of practitioners for the entire population. Long wait lists and the responsibility of the physician to see emergency cases first means that patients with SpA often wait for more than 6 months for an initial assessment. Screening all patients under the age of 45 with back pain for SpA would quickly overwhelm the current workforce. In some cases, the physician's practice may be full; thus, necessitating patients to either wait for long periods or travel out of their community. The number of MRI machines is also highly variable across the country, and wait times for MRI may range from a few weeks to 12 months. Again, those in remote areas may need to travel a great distance to have their MRI performed, which may not be feasible. MRI protocols vary significantly, and many radiology departments do not allow the entire spine and SI joints to be imaged in a single procedure. In such circumstances, it was felt that it was appropriate to image the SI joints first and to proceed to other areas of the spine if clinically indicated.

Disease Monitoring

Recommendation 15 addresses components of specific disease monitoring of patients with SpA that are reviewed briefly below.

Few studies examine the utility of patient history in monitoring, but it remains a critical part of the assessment of patients. A good history will aid the clinician in differentiating active SpA from mimicking conditions, such as mechanical back pain in axSpA, or polyarticular gout in peripheral SpA. (LOE IV, SOR D). Physical exam should be relevant to the patient's predominant presenting features, but all patients should have a tender joint count, swollen joint count, and entheseal assessment (LOE IV, SOR D). The presence of enthesitis in SpA has been associated with poorer functional outcomes, quality of life, and increased disease activity[33,34]. Specific metrology of the spine is not included because it was felt that general rheumatologists in Canada may not regularly assess these measurements in routine practice (LOE IV, SOR D). Baseline laboratory screening should be completed in the view of further management and potential toxicities (LOE IV, SOR D). Patients should be regularly screened for extraarticular manifestations and comorbid conditions (LOE IV, SOR D).

The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) was included in the monitoring recommendations. The BASDAI has been shown to be reliable, valid, and responsive to change[35–37]. The ASAS core set for clinical record keeping does not contain the entire BASDAI, but only the fatigue question[38]. In the Canadian context, BASDAI is often a mandatory component of the process of applying for biologic agents, and was thus felt to be worthy of inclusion. Since there are no specific studies demonstrating improved outcome in those with BASDAI measurements in comparison to those without, this recommendation is based on expert opinion (LOE IV, SOR D).

Also included was functional assessment. One potential measure of function could be the Bath Ankylosing Spondylitis Functional Index (BASFI) that is used in the ASAS recommendations for record keeping[38]. Of note, the BASFI is reliable, sensitive to change, and has demonstrated reproducibility in patients with SpA treated with TNFi[39,40]. The working group felt that it was important to assess patient function regularly, but left the specific tool for assessment to the discretion of the treating physician. Patient assessment of global well-being was included for similar reasons. Once again, the LOE and SOR for these recommendations are IV and D, respectively.

Elevated acute phase reactants (APR) was included since it may indicate propensity for radiographic progression or response to therapy. Patients with elevated APR have been shown to have the greatest benefit from NSAID therapy and TNFi in multiple studies[8,41–44]. C-reactive protein (CRP) has been associated with outcomes in AS and has been incorporated in to a matrix model for treatment[45]. In the large German Spondyloarthritis Inception Cohort, patients who had an elevated CRP had greater structural damage on radiographs, radiographic progression, and had greater progression from nr-axSpA to axSpA[10,46–48], and in that cohort any protective effect of NSAID was restricted to those patients with elevated CRP. In PsA, elevated baseline CRP has been found to be an independent risk factor for radiographic progression[49]. Patients with PsA with higher erythrocyte sedimentation rates were found to have greater rates of damage progression and less likelihood of reaching a minimal disease activity state[50]. Interestingly, patients with PsA who were beginning TNFi treatment were found to have a better response to therapy if their baseline CRP was elevated[51]. Elevated CRP has also been shown to differentiate patients with PsA from those with psoriasis without arthritis[52]. The LOE and SOR for this component of Recommendation 17 are II and B, respectively.

The working group agreed that patients with SpA should be monitored for drug toxicity and adherence, but there is no trial data to support that this monitoring improves outcomes in SpA. It is included on the basis of expert opinion (LOE IV, SOR D).

Recommendation 15 also includes appropriate imaging. The recent ASAS recommendations include both plain radiographs and MRI as acceptable imaging modalities[17]. A recent systematic review suggested that the utility of MRI in the diagnosis of SpA was limited because of a lack of high-quality studies[53]. There is 1 high-quality study showing that standardized evaluation of the MRI of SI joints in patients with SpA had high diagnostic utility[54]. The other high quality study evaluated the diagnostic utility of MRI of spinal inflammatory lesions[55]. The utility of imaging for monitoring of SpA is more controversial. A French group developed recommendations for imaging for the diagnosis and followup of AS in 2007 and suggested that imaging was not useful for monitoring response to treatment[56]. More recent studies have suggested that MRI may be useful for monitoring response to treatment with NSAID[8,48]. In an analysis of patients treated with adalimumab, the type of inflammation seen on MRI at baseline also predicted future progression and may represent a window of opportunity for disease modification[57]. The use of MRI and ultrasound for the diagnosis and monitoring of PsA has recently been reviewed, and an MRI scoring system has been developed[58,59]. Appropriate imaging should also be performed in peripheral

arthritis. In PsA, baseline joint damage increased the risk of damage progression[50]. Thus, radiographic assessment of peripheral joints is an important component of the monitoring of peripheral SpA. The LOE is II and SOR is B for this component of the recommendation.

The monitoring of patients with SpA should include an assessment of quality of life (QoL) with appropriate referrals to allied health if needed. Patients with PsA have been found to have worse QoL than those with psoriasis alone[60]. Additionally, patients with PsA have equivalent or worse QoL measures than comparative patients with RA, despite having less physical disability[61,62]. This may be because of the affect of the skin disease on QoL[61,62]. Patients with AS have been found to have decreased QoL in comparison to controls[63]. Stiffness, pain, fatigue, sleep, appearance, and worry about the future and medication side effects were the most prevalent QoL concerns[64]. In AS, poor QoL has been correlated with poor metrology and patient-reported outcomes[65–67]. Entheseal disease has also been shown to negatively affect QoL[33,34]. In PsA, the additional skin disease likely adds to poor QoL, as does the presence of comorbidities[61,62,68]. Unfortunately, there is no study that shows that monitoring QoL or referring to allied health improves outcomes in SpA (LOE IV, SOR D).

It is also recommended that patients are asked about participation in activities and work disability (WD) regularly with appropriate referrals to allied health, as needed. A systematic review of the WD in AS literature from 1980–2000 noted that high-quality studies were lacking[69]. The studies included in the systematic review included a wide range of figures on employment, from 3496% in patients with 5–45 years of disease duration[69]. As with employment, figures for WD encompassed a wide range, from a minimum of 3% to a maximum of 50%[69]. Patients also change the type of work they do because of AS, moving to less physically active jobs with time[70]. A large study from the United Kingdom showed that 40% of patients with AS of working age were unemployed, and that depression was a risk factor for both absenteeism and presenteeism[71]. The British Society for Rheumatology Biologics Register demonstrated high baseline WD in both AS (41%) and PsA (39%)[72]. Patients with higher HAQ scores and those performing manual labor were more likely to be WD[72]. Canadian studies in SpA have also shown high rates of WD[73,74]. Substantially fewer studies have examined WD in PsA alone. As recent systematic review found 19 publications, of which 9 were abstracts[75]. Seven studies reported rates of unemployment with a wide range (20–50%)[75]. Two cohort studies specifically reported on unemployment because of PsA, with unemployment levels of 22% and 23%[75]. Of note, only 1 study was deemed to be of methodologic "good quality"[75]. Despite the plethora of data supporting high levels of WD in SpA, there are no studies which demonstrate that asking patients about WD changes outcome. Thus, the LOE/SOR for this recommendation is IV, D.

Monitoring and management of extraarticular manifestations of SpA, such as inflammatory bowel disease, uveitis, and psoriasis, should be in collaboration with respective specialists as needed. This recommendation is made on the basis of expert opinion (LOE IV, SOR D). Similarly, management of comorbid conditions associated with inflammatory arthritis should be in collaboration with primary care physicians and appropriate specialists, as needed. Once again, this recommendation has a LOE of IV and

SOR D. A thorough review of the comorbid conditions associated with inflammatory arthritis (i.e., cardiovascular disease, hypertension, hyperlipidemia, diabetes, osteoporosis) are considered to be beyond the scope of these recommendations.

Frequency of monitoring will depend on disease severity, treatment type, and patient preference. We emphasize the importance of tailoring the therapeutic approach to the individual characteristics of the patient. Monitoring will be markedly different for patients with predominantly axial symptoms versus those with peripheral arthritis, enthesitis, and dactylitis. Patients with poor prognostic indicators may be monitored more frequently than those with slowly progressing disease.

The patient's overall clinical status may affect the frequency and intensity of patient monitoring. Many specific clinical features of SpA have been associated with outcome, and thus the clinician may alter their monitoring based on their presence. Older age and increased number of comorbidities have been found to predict greater rates of progression of functional disability in AS, as has the involvement of peripheral joints[76,77]. Women have been shown to have a higher burden of disease and less improvement than their male counterparts with AS, and may thus benefit from closer monitoring[78]. Patients with psoriatic SpA have worse functional and radiographic outcomes than those without[79]. Obese patients with PsA treated with TNFi had a more difficult time achieving MDA than their normal-weight counterparts[80]. Conversely, patients with well-established AS may have a plateau in clinical and functional outcomes, thus warranting less frequent followup[81]. However, there has not been a study assessing if frequency and intensity of monitoring of these clinical characteristics affects patient outcome.

Specific structural lesions should be monitored. Hip involvement in AS has been shown to be associated with worse functional and radiographic progression[82–84]. As with clinical monitoring, there has not been a specific study assessing the affect of monitoring structural damage on outcomes in SpA
Given the above, the frequency of monitoring recommendations are based upon expert opinion (LOE IV, SOR D).

The components of Recommendation 15 were discussed intensively by the working group, specifically centred on the utility of the Ankylosing Spondylitis Disease Activity Score (ASDAS) in routine Canadian clinical practice. Other recommendations, such as the recent recommendations of an international task force on treating to target in SpA, suggest that ASDAS, which incorporates an APR, should be used[23]. The ASDAS is a composite index for disease activity in AS composed of a calculated combination of 5 disease activity variables[85,86]. The ASDAS-CRP is preferred by ASAS, which has also established validated cutoffs for disease activity[86,87]. It was felt that the ASDAS was not a measure that would be enthusiastically adopted by Canadian general rheumatologists. The consensus was that even those in specialized SpA practice did not typically perform the ASDAS outside of clinical trials or studies. Accordingly, ASDAS was not included in the current recommendations.

These disease monitoring recommendations suffer from many barriers to implementation in the current Canadian healthcare context. Many Canadian rheumatologists provide care for a large patient population, thus reducing the time available to assess an individual patient. Assessments of function,

quality of life, and work are usually cumbersome and are not practical for many to perform on a regular basis. Comanagement of extraarticular features of SpA may be limited by access to treating specialists. Many Canadians also do not have established primary care physicians, resulting in difficulties with the monitoring and management of comorbid conditions associated with inflammatory arthritis.

Data Supplement continued in Online Supplementary Data 3…