Are All Routine Spondyloarthritis Outpatient Visits Considered Useful by Rheumatologists? An Exploratory Clinical Practice Study

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ABSTRACT. **Objective.** To determine (1) the proportion of routine spondyloarthritis (SpA) outpatient visits considered (un)necessary by rheumatologists, (2) characteristics of (un)necessary visits, and (3) whether previsit remote health outcome assessments can identify the necessity of ensuing visits.

Methods. A random sample of follow-up visits was evaluated at an SpA outpatient clinic. Before visits, patient-reported outcomes and disease activity were collected through an online health registry (SpA-Net). Rheumatologists were asked whether visits were considered necessary and whether therapy was altered. Clinical actions during visits were documented alongside demographic and clinical patient characteristics; these were compared for necessary vs unnecessary visits. Multivariable logistic regressions explored which previsit health outcomes (disease activity, patient-reported physical and mental health) were associated with the perceived necessity of visits. Predictive value was calculated for high disease activity thresholds of Ankylosing Spondylitis Disease Activity Score (ASDAS) and patient global assessment (PtGA).

Results. Of 114 outpatient visits, 39 (34.2%) were considered unnecessary. These visits involved fewer treatment changes (6 of 39 [15.4%] vs 39 of 75 [52.0%] visits) and clinical actions (9 of 39 [23.1%] vs 47 of 75 [62.7%] visits) compared to visits considered necessary. Previsit ASDAS (OR 4.06, 95% CI 1.80-9.17) and PtGA (OR 1.65, 95% CI 1.25-2.17) were associated with the perceived necessity of visits. Positive predictive value of ASDAS ≥ 2.1 and PtGA ≥ 3.0 were 91.7% and 80.0%, respectively.

Conclusion. Traditional physician-initiated follow-up for patients with SpA likely results in a suboptimal use of time and resources. Remote disease activity assessments can help identify patients for whom visits might be necessary from a rheumatologist's perspective.

Key Indexing Terms: ambulatory care, outcome, psoriatic arthritis, spondyloarthritis

Many clinics experience capacity issues due to a shortage of rheumatologists, and the disparity between rheumatology workforce supply and demand is predicted to increase over the next decade.[1,2] Consequently, waiting lists for new patients are a continuous challenge and ensuring rapid access to care in case of disease flares or side effects may become increasingly difficult, thereby affecting quality of care.[3] Initiatives addressing workforce shortages will benefit both patients and healthcare providers (HCPs) in the long term, but often require time to demonstrate positive effects due to organizational factors, the length of medical education programs, and the need for extensive government funding that is unlikely to occur in countries facing economic scarcity.

Meanwhile, additional efforts such as optimizing the efficiency of care are necessary to ensure timely access to care for patients and manage workload for caregivers. It remains a subject of debate whether regular prebooked follow-up visits are required for all patients with rheumatic diseases. After all, the disease course of many of these disorders can be unpredictable, resulting in patients presenting for specialist follow-up at times when disease activity is low or when no specific intervention is needed. When the patient is doing well, patients and clinicians may find these visits unnecessary.[4,5]

In recent years, several randomized controlled trials (RCTs) have shown promising results regarding the feasibility and effectiveness of telemonitoring interventions for patients with rheumatic conditions.[6,7] In particular, "asynchronous" telehealth solutions could potentially lower the number of follow-up appointments required for patients with chronic diseases, by facilitating patient self-monitoring without requiring real-time contact with HCPs.[8] Electronic systems that allow for remote measurement of disease activity and patient-reported outcome measures (PROMs) can be designed to offer protocoled treatment adjustments or schedule visits with medical personnel when patients' disease activity measures or other health outcomes exceed predefined cut-off values. RCTs have indeed demonstrated a successful implementation of interventions incorporating asynchronous telemonitoring modalities for rheumatoid arthritis (RA) and inflammatory bowel disease.[9-11]

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As a first step to understanding whether telemonitoring could be useful in spondyloarthritis (SpA), it is important to gain insight into the proportion of potentially unnecessary visits when monitoring these patients according to the current standard of care. Further, approaches to proactively identify patients that require specialist review according to rheumatologists should be explored; for example, by obtaining disease activity measures and PROMs through remote monitoring shortly before a planned outpatient visit and examining how validated cut-off values relate to meaningful clinical interactions in real-life outpatient care.

Here we report the results of a study conducted in an SpA outpatient clinic, aimed at determining the proportion of visits considered (un)necessary by rheumatologists in routine care. Additionally, we examined how often visits encompassed specific clinical actions and whether this was different for visits considered necessary and unnecessary. Finally, we explored the value of remote previsit assessments with different health outcome measures in identifying the perceived usefulness of routine outpatient visits by rheumatologists.

METHODS

Study design and data collection. An observational study was conducted between October 2018 and February 2019 at the SpA outpatient clinic of the Maastricht University Medical Center (MUMC+), the Netherlands. In this clinic, patients with SpA receive regular ambulatory care for monitoring of disease activity and optimization of treatment. If indicated, this includes routine laboratory tests for which standard laboratory order forms are provided to patients in advance. Visits are scheduled by the rheumatologist or a nurse, or at the patient's request. Most commonly, the interval between visits varies between 3 to 6 months; however, this can be shortened on demand, such as in the case of a disease flare or side effects of medication. Emergency consultations are performed elsewhere, on the emergency ward.

Patients are usually seen by a rheumatologist or by a fellow under supervision of a rheumatologist. Follow-up visits can also be performed by a specialized nurse as part of substitution of care, again under supervision, in which case no distinction is made with regard to the reason for the visit. Visits that are booked strictly for patient education or guidance when starting medication are an exception, as these are provided independently (and exclusively) by trained nurses. In the present study, only visits performed by a rheumatologist or a rheumatology fellow were considered.

A study nurse randomly selected sampling days, in which all consecutive outpatient follow-up visits taking place during the same day part (at random; either morning or afternoon) were included for assessment. Visits were eligible under the condition that patients were (1) physically present during the appointment, and (2) diagnosed with any SpA phenotype according to the treating rheumatologist.

The following patients' demographic and clinical characteristics were gathered from the patients' electronic medical file and from a disease-specific electronic health system and quality registry for SpA in the Netherlands (SpA-Net)[12]: age, sex, diagnosis, time since first symptoms, current antirheumatic therapy, number of rheumatology outpatient visits in the previous year, disease activity, and health status. Disease activity was measured by C-reactive protein (CRP), patient global assessment of disease activity (PtGA), Ankylosing Spondylitis Disease Activity Score (ASDAS) with CRP,[13] and Bath Ankylosing Spondylitis Disease Activity Index (BASDAI).[14] Generic health-related quality of life was measured using the Short-Form 36 Health Survey (SF-36)[15] and physical functioning with the Health Assessment Questionnaire for the Spondyloarthropathies (HAQ-S).[16] All patients with SpA had been instructed, upon entry in SpA-Net, to complete questionnaires (including the PROMs of interest in this study) in SpA-Net as part of standard care in the week prior to the outpatient visit.

Immediately after each consultation, rheumatologists were additionally asked to complete 2 questions on their opinion regarding the necessity of the individual outpatient visit (yes/no) and whether pharmacological therapy was altered (yes/no). Also, information on prespecified clinical actions resulting from the clinical visit of interest was gathered by a researcher (KH) from each patient's electronic medical file. This included medical treatment alterations, diagnostic investigations (ie, urinalysis, additional blood tests [excluding routine blood tests], medical imaging) in relation to the consultation, therapeutic interventions (intraarticular or intramuscular injection), and referrals to other HCPs.

Ethical considerations. All patients had independently granted permission for the use of anonymized data collected in SpA-Net for research purposes prior to this project. Permission was obtained through an informed consent form at the time of the patients' initial registration in SpA-Net as part of standard care at the study site. Due to the design of this study, the protocol was not subject to additional approval by an ethical committee.

Statistical analysis. Descriptive statistics were used to characterize patients whose visits were considered necessary or not, by reporting the mean (SD) or frequencies for dichotomous data. For continuous data, independent t tests or nonparametric tests were used, as appropriate, to compare group differences between visits that, respectively, were considered necessary vs unnecessary. Chi-square tests were used for dichotomous data.

Univariable analyses were performed to identify previsit health outcomes (disease activity, patient-reported physical and mental health), as well as demographic and clinical patient characteristics associated with the perceived necessity of visits. A multivariable logistic regression analysis (backward regression method) was performed with health outcomes that were statistically significant in the univariable analyses, and age, sex, and the number of visits in the previous year. Two models were tested: one with ASDAS, for which a CRP value is also necessary and thus requires patients to visit a healthcare facility for venous blood sampling; and one with BASDAI and PtGA, which can be obtained entirely remotely. Collinearity between variables in the models was checked. Interactions between the variables were explored by additional analyses that included the main effect variables and the interaction term for each interaction studied.

Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), as well as the positive and negative likelihood ratios (LR+ and LR−, respectively), were calculated for high vs low disease activity (HDA and LDA, respectively) states according to the strongest determinants, in relation to perceived necessity of a visit. Cut-off values for HDA used were ASDAS-CRP ≥ 2.1 and PtGA ≥ 3.0.[17] All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 25 (IBM Corp). The significance level was set at 0.05.

RESULTS

Study sample and perceived necessity of visits. Five rheumatologists and 3 rheumatology fellows reported on 114 unique outpatient visits, on 17 separate days. Patients' clinical and demographic characteristics of the total sample are shown in Table 1. In total, 39 out of 114 (34.2%) visits were not considered necessary by the attending physician.

Visit characteristics. Table 1 compares characteristics of necessary opposed to unnecessary visits. In patients with previsit LDA, defined as ASDAS < 2.1 or PtGA < 3.0, 20 of 36 (55.6%) and 13 of 20 (65.0%) visits, respectively, were considered unnecessary, whereas this was 3 of 36 (8.3%) and 11 of 55 (20.0%) in patients with HDA.

Table 2 shows actions during or resulting from the outpatient visits under study. Visits considered necessary encompassed significantly more clinical actions; in particular, more changes in pharmacological treatment. Interestingly, 58 out of 114 (50.9%)

Table 1. Study population characteristics.

| | N = 114 | Visit Considered Necessary? | |
		Yes, n = 75	No, n = 39
Age, yrs	54.8 (13.2)	53.0 (12.7)	58.3 (13.6)
Male sex, n (%)	50 (43.9)	32 (42.7)	18 (46.2)
Diagnosis, n (%)			
Axial SpA	41 (36.0)	27 (36.0)	14 (35.9)
Peripheral SpA	58 (50.9)	38 (50.7)	20 (51.3)
Of which PsA	44 (38.6)	29 (25.4)	15 (13.2)
Combined	15 (13.2)	10 (13.3)	5 (12.8)
Symptom duration, months	248.9 (285.7)	221.5 (266.8)	296.3 (314.4)
Current use of NSAID, n (%)	71 (62.3)	50 (66.7)	21 (53.8)
Current use of csDMARD, n (%)	44 (38.6)	28 (37.3)	16 (41.0)
Current use of GCs, n (%)	10 (8.8)	5 (6.7)	5 (12.8)
Current use of bDMARD, n (%)	57 (50.0)	39 (52.0)	18 (46.2)
No current antirheumatic therapy, n (%)	5 (4.4)	3 (4.0)	2 (5.1)
Visits in previous year	2.4 (1.7)	2.7 (1.7)	2.0 (1.4)
CRP, mg/L	4.6 (7.1)	5.5 (8.4)	2.9 (3.0)
ASDAS	2.3 (1.0)	2.6 (0.9)	1.5 (0.7)
BASDAI	4.4 (2.2)	5.0 (2.0)	3.1 (2.0)
PtGA	4.5 (2.5)	5.4 (2.2)	2.7 (2.2)
SF-36 PCS	37.9 (10.9)	35.3 (9.4)	44.8 (11.9)
SF-36 MCS	49.0 (11.7)	48.9 (12.4)	49.0 (9.9)
HAQ-S	0.9 (0.7)	1.1 (0.6)	0.5 (0.6)

Values are expressed as mean (SD) unless indicated otherwise. ASDAS: Ankylosing Spondylitis Disease Activity Score; BASDAI: Bath Ankylosing Spondylitis Disease Activity Index; DMARD: disease-modifying antirheumatic drugs; CRP: C-reactive protein; csDMARD: conventional synthetic DMARD; bDMARD: biologic DMARD; GC: glucocorticoid; HAQ-S: Health Assessment Questionnaire for the Spondyloarthropathies; MCS: mental component summary; NSAID: nonsteroidal antiinflammatory drugs; PCS: physical component summary; PsA: psoriatic arthritis; SF-36: 36-item Short Form Health Survey; SpA: spondyloarthritis.

visits did not result in any of the prespecified clinical actions, of which 30 of 39 (76.9%) visits were considered unnecessary, and 28 of 75 (37.3%) visits were still considered necessary. Further, 79 out of 114 (69.3%) visits did not lead to any pharmacological treatment changes, of which 34 of 39 (87.2%) visits were considered unnecessary and 45 of 75 (60.0%) visits were considered necessary.

The number of clinical actions per individual patient varied from 0 to 4. Additional blood tests and conventional radiographic imaging were the most frequently conducted diagnostic procedures. Additional laboratory tests consisted of serum concentrations of biologics, and screening tests for tuberculosis and viral hepatitis before initiation of biologic therapy. Prescribed medical aids comprised orthopedic insoles and finger splints. Referrals to paramedical caregivers were made to occupational therapists and physiotherapists. No patients were admitted for unplanned day care treatment or hospitalization in this study period.

Predictive value of previsit health outcome assessments. Table 3 shows the results of the logistic regression analysis of factors associated with perceived necessity of visits. In the univariable analysis, younger patient age, more frequent outpatient visits in the previous year, higher disease activity, and worse physical functioning were associated with the perceived necessity of visits. In the multivariable analysis model with ASDAS, ASDAS was significantly associated with perceived necessity of the visit (OR 4.06, 95% CI 1.80-9.17). In the multivariable

analysis model with BASDAI and PtGA, only PtGA was significantly associated with perceived necessity of the visit (OR 1.65, 95% CI 1.25-2.17). No interactions were found between variables in the models.

Sensitivity, specificity, PPV, NPV, LR+ and LR− for HDA vs LDA states in relation to perceived necessity of a visit are described in Table 4. When measured prior to visits, ASDAS ≥ 2.1 had a specificity of > 80.0% and PPV of > 90.0% for predicting the perceived necessity of a visit, but sensitivity was < 70.0% and NPV was < 60.0%. PtGA ≥ 3 had a sensitivity and PPV of ≥ 80.0%, but specificity was < 60.0% and NPV was < 70.0%.

DISCUSSION
Out of all 114 routine SpA outpatient follow-up visits included in this study, 39 (34.2%) were considered unnecessary by the rheumatologist. Antirheumatic therapy remained unchanged in 79 (69.3%) of all outpatient visits and 58 (50.9%) did not lead to any clinical actions, amounting to 87.2% (34 of 39 visits) and 76.9% (30 of 39 visits), respectively, among those that were considered unnecessary. In cases where ASDAS or PtGA detected HDA prior to visits, the probability of visits subsequently being perceived as useful by rheumatologists was 91.7% and 80.0%, respectively.

To our knowledge, no other studies to date have assessed the proportion of SpA outpatient visits considered (un)necessary by rheumatologists in real-life care. However, a study documenting

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Table 2. Characteristics of clinical actions resulting from outpatient visits and in relation to perceived necessity of visits.

| | Frequency (%), N = 114 | Visit Considered Necessary? | | P |
		Yes (%), n = 75	No (%), n = 39	
Any clinical action				
Any therapeutic action, referral, or investigation	56 (49.1)	47 (62.7)	9 (23.1)	< 0.01
Related to therapy				
Any therapeutic action	45 (39.5)	39 (52.0)	6 (15.4)	< 0.01
Antirheumatic therapy altered	35 (30.7)	30 (40.0)	5 (12.8)	< 0.01
Dose increased	3 (2.6)	3 (4.0)	0 (0.0)	0.55
Dose reduced	4 (3.5)	2 (2.7)	2 (5.1)	0.61
Medication stopped	5 (4.4)	4 (5.3)	1 (2.6)	0.66
Switch to different antirheumatic drug	10 (8.8)	10 (13.3)	0 (0.0)	0.02
Mode of administration altered	1 (0.9)	1 (1.3)	0 (0.0)	1.00
Start NSAID	8 (7.0)	8 (10.7)	0 (0.0)	0.05
Start csDMARD	3 (2.6)	3 (4.0)	0 (0.0)	0.55
Start bDMARD	9 (7.9)	9 (12.0)	0 (0.0)	0.03
Start CS	9 (7.9)	8 (10.7)	1 (2.6)	0.16
Intraarticular injection of CS	8 (7.0)	7 (9.3)	1 (2.6)	0.26
Analgesic therapy altered	5 (4.4)	5 (6.7)	0 (0.0)	0.16
Nonrheumatic therapy altered	3 (2.6)	1 (1.3)	2 (5.1)	0.27
Medical aid prescribed	5 (4.4)	5 (6.7)	0 (0.0)	0.16
Referrals				
Any referral	11 (9.6)	10 (13.3)	1 (2.6)	0.07
Paramedical caregiver	8 (7.0)	7 (9.3)	1 (2.6)	0.26
Other medical specialist	2 (1.8)	2 (2.7)	0 (0.0)	0.55
General practitioner	3 (2.6)	3 (4.0)	0 (0.0)	0.55
Additional diagnostic investigations				
Any investigation	19 (16.7)	15 (20.0)	4 (10.3)	0.19
Additional blood tests	10 (8.8)	9 (12.0)	1 (2.6)	0.16
Urinalysis	0 (0.0)	0 (0.0)	0 (0.0)	NA
Ultrasound	1 (0.9)	1 (1.3)	0 (0.0)	1.00
Radiographs	9 (7.9)	7 (9.3)	2 (5.1)	0.72
MRI	0 (0.0)	0 (0.0)	0 (0.0)	NA
Other (ie, DXA)	1 (0.9)	0 (0.0)	1 (2.6)	0.34

Values are expressed as n (%) unless indicated otherwise. bDMARD: biologic DMARD; CS: corticosteroids; csDMARD: conventional synthetic DMARD; DMARD: disease-modifying antirheumatic drugs; DXA: dual-energy X-ray absorptiometry; MRI: magnetic resonance imaging; NA: not applicable; NSAID: nonsteroidal antiinflammatory drug.

rheumatologists' opinions of 211 separate visits in an RA outpatient clinic reported comparable results: 42% of all visits were considered unnecessary, medication remained unaltered in 76%, no clinical actions were taken in 30% of visits, and only 55% required specialist review according to the attending rheumatologists.[5] Thus far, besides our study, no research has investigated whether this also applies to other rheumatic diseases. Based on our findings, it seems likely that routine follow-up appointment scheduling for patients with SpA currently leads to suboptimal use of time and resources.

With healthcare costs[18] and rheumatology workforce shortages[1,2] projected to increase, this might be a call to reconsider the way outpatient care is organized. Reducing the number of unnecessary visits could increase flexibility for patients and physicians, shorten waiting lists, and potentially decrease healthcare expenditure. Previously conducted research in patients with RA,[4] as well as a study among patients with RA and psoriatic arthritis taking methotrexate, has demonstrated that patient self-monitoring of disease-modifying antirheumatic drug therapy combined with patient-initiated care is possible, with a

clear reduction in healthcare utilization while maintaining clinical and psychological well-being.[19]

More recently, the coronavirus disease 2019 (COVID-19) pandemic resulted in a complete shift in provision of care in many countries. During multiple time periods in 2020 and 2021, only a limited number of face-to-face consultations took place for urgent problems or when necessitated by patients' individual circumstances, and many follow-up visits were replaced by telephone or video consultations, eventually provided on an "on-demand" basis, if at all.[20-22] This seemed to work well at the beginning of the COVID-19 crisis[22-24] and, necessitated by these exceptional circumstances, rheumatologists worldwide have become more acquainted with technological solutions that could help tackle preexisting issues related to the delivery of outpatient care moving forward.[25]

Our results suggest that patients with LDA and good physical functioning, who only require infrequent follow-up, are less likely to benefit from regular prebooked visits, according to rheumatologists. These patients could be eligible for follow-up through remote or self-monitoring initiatives for extended

Table 3. Factors associated with perceived necessity of visits.

	Univariable Analysis			Multivariable Analysis Model With ASDAS, n = 72			Multivariable Analysis Model With BASDAI and PtGA, n = 74		
	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*
Age, yrs	0.97	0.94-0.99	0.04	–	–	–	–	–	–
Male sex	0.87	0.40-1.89	0.72	–	–	–	–	–	–
Diagnosis[a]	1.01	0.56-1.81	0.98						
Symptom duration, months	1.00	1.00-1.00	0.25						
Current use of NSAID	1.71	0.78-3.78	0.18						
Current use of csDMARD	0.86	0.39-1.89	0.70						
Current use of GCs	0.49	0.13-1.79	0.28						
Current use of bDMARD	1.26	0.58-2.75	0.55						
No current antirheumatic therapy	1.30	0.21-8.11	0.78						
Visits in previous year	1.31	1.01-1.70	0.049	–	–	–	–	–	–
CRP, mg/L	1.10	0.98-1.24	0.10						
ASDAS	4.84	2.18-10.75	< 0.01	4.06	1.80-9.17	< 0.01	NA	NA	NA
BASDAI	1.58	1.20-2.08	< 0.01	NA	NA	NA	–	–	–
PtGA	1.63	1.28-2.09	< 0.01	NA	NA	NA	1.65	1.25-2.17	< 0.01
SF-36 PCS	0.91	0.86-0.97	< 0.01	–	–	–	–	–	–
SF-36 MCS	1.00	0.95-1.05	0.98						
HAQ-S	4.33	1.44-13.02	< 0.01	–	–	–	–	–	–

[a] Axial SpA, peripheral SpA, or combined (axial and peripheral SpA). Variables included in backward stepwise logistic regression analysis, but not retained in the final model (P > 0.10). ASDAS: Ankylosing Spondylitis Disease Activity Score; BASDAI: Bath Ankylosing Spondylitis Disease Activity Index; bDMARD: biological DMARD; CRP: C-reactive protein; csDMARD: conventional synthetic DMARD; DMARD: disease modifying antirheumatic drugs; GC: glucocorticoid; HAQ-S: Health Assessment Questionnaire for the Spondyloarthropathies; MCS: mental component summary; NA: not applicable; NSAID: nonsteroidal antiinflammatory drugs; PCS: physical component summary; PtGA: patient global assessment of disease activity; SF-36: 36-Item Short Form Health Survey; SpA: spondyloarthritis.

Table 4. Predictive value of previsit disease activity assessments in relation to perceived necessity of a visit.

	Frequency	Visit Considered Necessary?		Sensitivity, %	Specificity, %	PPV, %	NPV, %	LR+	LR−
		Yes, n (%)	No, n (%)						
ASDAS < 2.1	36	16 (44.4)	20 (55.6)	–	–	–	–	–	–
ASDAS ≥ 2.1	36	33 (91.7)	3 (8.3)	67.3%	87.0%	91.7%	55.6%	5.16	0.38
PtGA < 3.0	20	7 (35.0)	13 (65.0)	–	–	–	–	–	–
PtGA ≥ 3.0	55	44 (80.0)	11 (20.0)	86.3%	54.2%	80.0%	65.0%	1.88	0.25

ASDAS: Ankylosing Spondylitis Disease Activity Score; LR+: positive likelihood ratio; LR−: negative likelihood ratio; NPV: negative predictive value; PPV: positive predictive value; PtGA: patient global assessment of disease activity (numeric rating scale: 0-10).

periods of time, providing that subjects for whom specialist review is due can be identified proactively. Previous findings among patients with RA indicate that newer technological advances, such as combining remote collection of PROMs with algorithms for detecting worsening disease in eHealth platforms, can help in providing individually tailored care for these individuals.[11] So far, no studies have investigated this for SpA.

As a final objective, this study explored whether previsit remote assessment of health outcome measures could aid in identifying the perceived necessity of ensuing visits among patients with SpA. We found that high ASDAS and high PtGA were independent predictors of perceived necessity of visits in multivariable analyses. Along the same line, we showed that previsit ASDAS ≥ 2.1 performed well (PPV > 90.0%) with regard to predicting the necessity of visits as perceived by rheumatologists, as did PtGA ≥ 3.0 (PPV = 80.0%). Although our study demonstrates a strong correlation between ASDAS and the perceived

usefulness of outpatient visits by rheumatologists, composite measures that require blood samples to be collected at healthcare facilities might prove relatively impractical in this context. Our data indicate that single-item PROMs such as PtGA, while unable to replace periodic blood sampling to monitor for drug toxicity or systemic disease manifestations, may also perform relatively well for this purpose.

Nonetheless, sensitivity would be insufficient to rely on disease activity measures alone to preemptively determine the necessity of planned visits in clinical practice. The authors also wish to underline that these measures are not suitable for excluding patients from access to care, as illustrated by the limited specificity and NPV for this purpose.

A strength of this study was the random sampling of the visits. Demographic and clinical characteristics of the study sample corresponded very well to previously published population values for the entire SpA-Net patient cohort consisting of data

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gathered during everyday practice in 5 different hospitals in the Netherlands, adding to the representativeness of these findings.[12] Nevertheless, some limitations need to be addressed. First, only rheumatologists' opinions about the necessity of outpatient visits were investigated. Patients' opinions were not examined, despite the fact that they may benefit from visiting their rheumatologist for various reasons other than disease activity or functional status, and their perceptions regarding the necessity of visits may differ from that of the rheumatologists. Second, this study did not intend to elucidate all factors contributing to the physicians' respective judgments, such as patients' self-management skills or health literacy, regardless of their disease course. Therefore, the role of various clinical and patient-related factors that influenced the perceived necessity of visits or the number of appointments in the previous year may have gone undetected. In addition, not all of the variability in the rheumatologists' judgments is easily explained from a strictly medical perspective. This was observed in 1 visit that was considered unnecessary, despite an intraarticular injection of corticosteroids (Table 2). Also, 8.3% to 20.0% of visits considered unnecessary by the attending rheumatologist involved patients with HDA according to ASDAS or PtGA, respectively (Table 4). Hence, rheumatologists' perceptions regarding the necessity of visits likely constitute complex, multifactorial decisions that may also be influenced by personal or subjective factors. Nonetheless, these findings are not entirely unexpected. A recent observational study based on SpA-Net data from 5 participating hospitals in the Netherlands indicated that while HDA (ASDAS ≥ 2.1) was observed in up to 62% of patients with axSpA in daily practice, these scores did not seem to be used for determining treatment adaptation nor the frequency of reevaluation.[26] This might indicate that treat-to-target strategies are not yet widely implemented for patients with axSpA, a finding also reported in a 2015 UK physician survey on the management of patients with PsA.[27] Third, not all patients answered the online questionnaires prior to visits. As a result, for subgroup analyses that include PROMs, sample size is relatively limited and selection bias cannot be excluded. Finally, some visits that were reportedly perceived as unnecessary still resulted in what can be considered meaningful clinical interactions. For example, our sample included 5 visits that were perceived as unnecessary despite having resulted in changes to antirheumatic medication, with 3 of these 5 visits leading to tapering of therapy (Table 2). For this reason, as well as other nonmedication-related circumstances such as discussing employment or psychosocial circumstances, low-frequency (eg, annual) follow-up can still prove relevant for patients who are doing well.

In conclusion, we observed that more than one-third of all routine outpatient visits under study were considered unnecessary by the attending rheumatologist. This indicates that the traditional physician-initiated follow-up regimen likely results in suboptimal use of time and resources. Additional research is needed to investigate the safety and (cost-)effectiveness of alternative follow-up strategies for patients with SpA. Telemonitoring through eHealth systems that allow remote collection of PROMs and disease activity variables holds great potential in this regard. Remote assessment of disease activity can support patient safety by proactively identifying patients who are likely to benefit from clinical review in a telemonitoring or patient-initiated care context. Future research should assess whether discordance exists between patients' and rheumatologists' opinions regarding the perceived necessity of routine outpatient visits and which factors motivate this judgment.

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