





**BRIEF REPORT**

# Pregnancy Intention Screening in Patients With Systemic Rheumatic Diseases: Pilot Testing a Standardized Assessment Tool

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**Objective.** Systemic rheumatic conditions affect reproductive-aged patients and often require potentially teratogenic medications. We assessed the feasibility and impact of a standardized pregnancy intention screening question (One Key Question [OKQ]) in a large academic rheumatology practice.

**Methods.** This 6-month pilot quality improvement initiative prompted rheumatologists to ask female patients aged 18 to 49 years about their pregnancy intentions using OKQ. We administered surveys to assess rheumatologists' barriers to and comfort with reproductive health issues. We performed chart reviews to assess uptake and impact on documentation, comparing charts with OKQ documented with 100 randomly selected charts eligible for pregnancy intention screening but without OKQ documented.

**Results.** When we compared 32 of 43 preimplementation responses with 29 of 41 postimplementation responses, the proportion of rheumatologists who reported they were very comfortable with assessing their patients' reproductive goals increased (31%–38%) and the proportion reporting obstetrics and gynecology (OB/GYN) referral challenges as barriers to discussing reproductive goals decreased (41%–21%). During the implementation period, 83 of 957 (9%) eligible patients had OKQ documented in their chart. Female providers were more likely to screen than male providers (odds ratio 2.42, 95% confidence interval 1.21–4.85). Screened patients were more likely to have their contraceptive method documented ( $P < 0.001$ ) and more likely to have been referred to OB/GYN for follow-up ( $P = 0.003$ ) compared with patients who were not screened with OKQ.

**Conclusion.** Although uptake was low, this tool improved provider comfort with assessing reproductive goals, the quality of documentation, and the likelihood of OB/GYN referral. Future studies should examine whether automated medical record alerts to prompt screening increase uptake.

## INTRODUCTION

The prevalence of systemic rheumatic diseases (SRDs) is substantially higher in people assigned female at birth (AFAB) than

people assigned male at birth. Although sex ratios vary by disease, nearly three quarters of all SRD cases occur in AFAB individuals (1). Moreover, AFAB individuals are disproportionately affected during their reproductive years, with peak incidence

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### SIGNIFICANCE & INNOVATIONS

- Although rheumatologists are acutely aware of the need for pregnancy intention screening for pregnancy-capable patients with systemic rheumatic conditions, fewer than one third of rheumatologists at a large academic center felt very comfortable assessing their patients' preferences.
- A simple pregnancy intention screening question can be readily incorporated into routine practice and can improve the quality of documentation of reproductive health issues as well as access to contraception.
- Pregnancy intention screening uptake without an established electronic medical record-based prompt was low. Further efforts are needed to remind providers to incorporate this screening tool into their routine practice.

occurring in the late teens to the 40s across many connective tissue diseases (2).

Preconception planning is beneficial to any pregnancy but is particularly important for individuals with medical conditions that can be aggravated by pregnancy. Up to 6% of pregnancies in the United States may be associated with exposure to high-risk or teratogenic medications (3). People with SRD may be disproportionately affected given the frequent use of these medications, but they are less likely to use contraception compared with people without SRD (4–6). Among reproductive-aged AFAB individuals with SRD, poor maternal and fetal outcomes may occur if disease activity and medication use are not optimized preconception (7–9). Despite these risks, less than half of reproductive-aged AFAB individuals with SRD receive contraception counseling or contraception, and those who do not receive counseling are more likely to use less efficacious methods, such as barrier and natural family planning methods (5). Literature on the potential impact of interventions to increase pregnancy intention assessment among patients with SRD is scant, but prior findings indicate that provider knowledge and comfort may constitute barriers. In a qualitative study, rheumatologists were interested in providing reproductive health counseling but reported barriers, including personal comfort level, lack of guidelines, and tension to respect patient autonomy (10). Rheumatologists have also been shown to have variable knowledge of teratogens, contraception, and pregnancy risk factors (11).

In this quality improvement initiative, we introduced a simple pregnancy intention screen, One Key Question (OKQ), to our academic rheumatology practice. This tool has been shown to be simple to implement and well received by reproductive-aged women and health care providers but has not yet been assessed among patients with complex medical conditions (12). In the primary care setting, the use of OKQ increased patient satisfaction (13). In addition, when OKQ was compared with a different

reproductive counseling tool, the Family Planning Quotient, 50% of providers (compared with 37%) found OKQ to be helpful, and approximately 66% of patients found it to be a useful way to communicate their reproductive plans to their providers (14). We selected OKQ because it was both simpler and more directly applicable to the rheumatology practice setting than the Pregnancy Attitudes, Timing, How Important Is Prevention tool (15). We aimed to pilot the implementation of the OKQ screening tool in a multisite rheumatology practice and assess the subsequent quality of reproductive health preference documentation. We hypothesized that OKQ would facilitate better documentation of reproductive health preferences and increase provider comfort with pregnancy intention screening and that female compared with male rheumatologists would be more likely to use the OKQ screener.

### PATIENTS AND METHODS

**Provider surveys.** At the start of the initiative, there were 43 rheumatologists (56% female) who cared for patients at Brigham and Women's Hospital rheumatology practices. We first administered a 13-item baseline survey to the rheumatologists to assess their comfort with pregnancy intention screening and contraceptive prescribing (Supplementary Material). Six months later, an identical postsurvey was administered (N = 41).

**Pregnancy intention screening tool.** We used OKQ, "Would you like to become pregnant in the next year?" as our pregnancy intention screening question. OKQ is a proprietary, registered trademark question controlled by the independent not-for-profit organization Power to Decide. We received permission from Power to Decide to implement the screening question without their full standard training given the time constraints of providers and the desire to provide background materials that were directly applicable to the care of complex patients with rheumatic conditions. Thus, our screening initiative does not represent full fidelity to the OKQ model.

**Electronic medical record-based implementation.** We manually flagged patients AFAB aged 18 to 49 with SRD for screening in the electronic medical record's (EMR's) "huddle note" column of each provider's daily patient list. SRD included connective tissue diseases (eg, systemic lupus erythematosus), antiphospholipid syndrome, inflammatory arthritis, spondyloarthropathies, and vasculitis. Laminated reminder slips on bright pink paper were placed in each examination room to prompt providers to ask the screening question, use the smart phrase to document the response, and then refer to obstetrics and gynecology (OB/GYN) through the appropriate pathway if indicated (Supplementary Material). Within the EMR, we developed a smart phrase template with OKQ ("Would you like to become pregnant in the next year?") with "yes," "no," "unsure," or "not applicable"

responses and suggested next steps contingent on the response chosen (Supplementary Material). For example, if the response was “yes,” the provider was prompted to review medications prescribed to ensure compatibility with pregnancy. If the response was “no,” a referral to OB/GYN was suggested for patients in need of contraception. We also introduced new options in the EMR-based referral template for preconception counseling and complex contraception management to facilitate efficient access to the appropriate OB/GYN clinicians.

This practice-wide initiative was launched with a rheumatology grand rounds seminar jointly led by OB/GYN and rheumatology faculty. The seminar presentation included a review of the importance of documenting pregnancy intentions for patients with SRD, updates in highly effective contraception, instruction regarding how to implement OKQ screening, EMR documentation of screening, and EMR referral instructions for initiating OB/GYN consultation with specialists in complex contraception. Rheumatologists who did not attend received a copy of the slides the same day. The 6-month evaluation period started on the date of the grand rounds.

**Outcome assessment and statistical analyses.** We compared rheumatologists’ survey responses prior to the introduction of this tool ( $N = 43$ ) with responses 6 months following ( $N = 41$ ) to identify possible changes in comfort with assessing pregnancy intentions. To encourage honest responses regarding potentially sensitive work-related practices, the survey was anonymous. Therefore, this was a repeat cross-sectional survey of the same population of providers, with responses not linked to an individual identifier for each provider, precluding the use of formal statistical tests to assess change over time.

Our primary measure of interest was use of the OKQ smart phrase to document pregnancy intention during the 6-month period following the grand rounds launch. Secondly, we examined predictors of any documentation of pregnancy intention (including screening without use of OKQ) and any documentation of contraceptive use by a rheumatologist during the study period. To accomplish this, we first identified all charts from our eligible cohort in which the OKQ smart phrase was documented. From the remaining eligible charts without OKQ documentation, we randomly selected 100 charts to review and compare with those with OKQ documentation. A physician study team member (KPP) manually reviewed the content of reproductive screening conversations and contraceptive method documentation by reviewing rheumatology providers’ clinical notes for the randomly selected 100 charts as well as those with OKQ documentation. Instances of ambiguous clinical note content were further adjudicated by a rheumatologist (CHF) and social scientist (EJ) when indicated. We used descriptive statistics ( $t$ -tests, tests for differences in simple proportions, and Fisher’s exact tests) and logistic regression to compare patients who were screened (with OKQ or other documentation) versus the randomly selected subset of

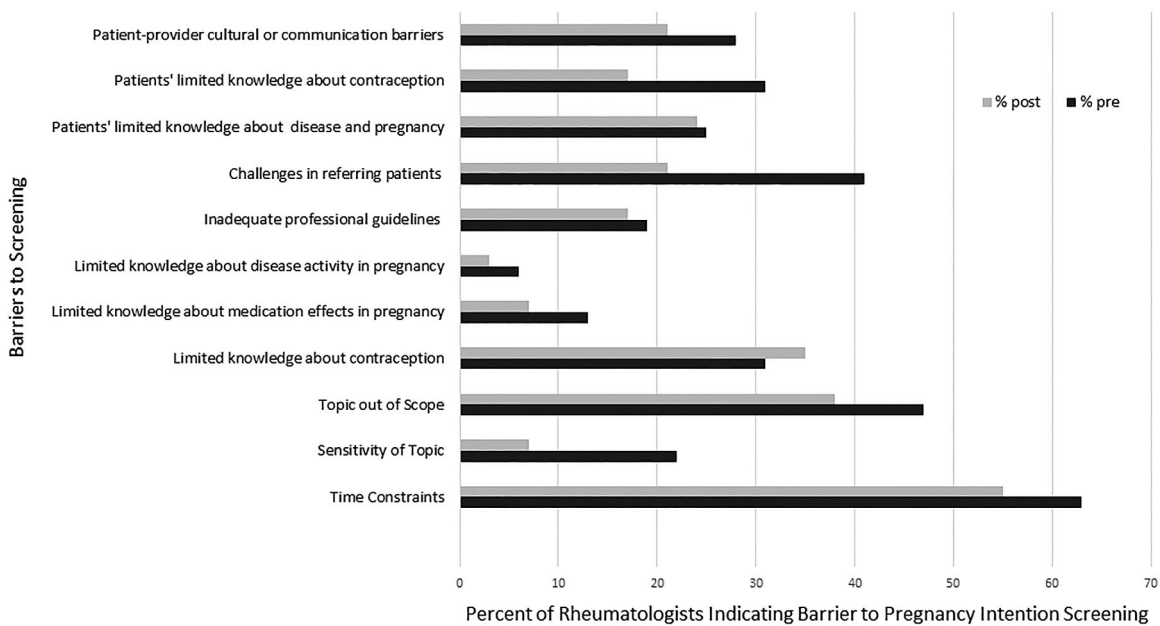
patients who had been flagged for screening but were not screened for pregnancy intentions. We compared uptake of pregnancy intention screening by provider sex because we hypothesized that female providers would be more likely to assess and document reproductive health preferences than male providers. This study was approved by the Mass General Brigham Institutional Review Board.

## RESULTS

**Rheumatologist survey results.** Of eligible rheumatologists, 74% (32 of 43) responded to the baseline survey and 71% (29 of 41) responded to the postimplementation survey (Figure 1). When asked about comfort with discussing patients’ reproductive goals, 31% felt very comfortable preimplementation, compared with 38% postimplementation. Few rheumatologists (16% preimplementation and 17% postimplementation) felt very comfortable counseling patients about contraceptive options. Whereas most responding providers both preimplementation (81%) and postimplementation (79%) discussed contraception somewhat or very often with their reproductive-aged, pregnancy-capable patients, and nearly all providers discussed risks of medications in pregnancy, few used educational materials or prescribed contraception. Of providers preimplementation, 72% said they discuss specific steps to prepare for pregnancy, either very or somewhat often with their patients, compared with 59% postimplementation. Similar percentages (23% preimplementation and 24% postimplementation) indicated that they refer to an OB/GYN provider for general contraceptive counseling very often, and 19% preimplementation and 24% postimplementation indicated they refer to another provider for a specific contraceptive method (eg, intrauterine device) very often.

Rheumatologists endorsed multiple potentially modifiable barriers to pregnancy intention screening, including time constraints, sensitivity of the topic, limited knowledge about contraception, and challenges to referring patients to OB/GYN. When we compared pre- with postimplementation responses (Figure 1), there were notable reductions in the percentage of rheumatologists citing all barriers except for limited knowledge about contraception. The percentage of rheumatologists citing challenges in referring patients to OB/GYN was 41% on the preimplementation survey and 21% on the postimplementation survey. In addition, fewer rheumatologists felt pregnancy intention screening was out of the scope of their practice (47% preimplementation and 38% postimplementation), and fewer felt that the sensitivity of the topic was a barrier (22% preimplementation and 7% postimplementation).

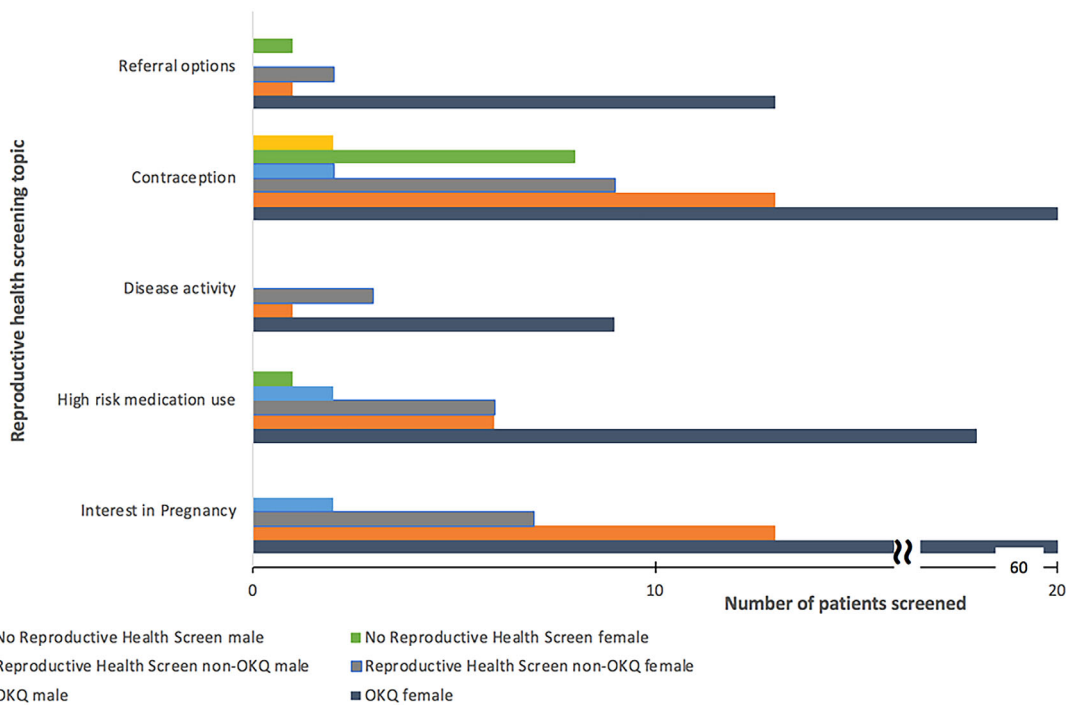
**OKQ implementation.** Over the 6-month pilot, among 957 reproductive-aged AFAB patients with SRD flagged in the rheumatologists’ daily patient list, 11 of the 43 providers (82% female) used the OKQ smart phrase to document



**Figure 1.** Percentage of rheumatologists endorsing each barrier to reproductive screening preimplementation (n = 32 of 43) versus postimplementation (n = 29 of 41).

reproductive health preferences for 83 patients (8.7%). We identified 84 records for which the smart phrase was initiated, but one record was excluded from analysis because the smart phrase was not ultimately entered into the chart by the provider. Most smart phrase use (66 of 83, 80%) occurred in the first 3 months of the implementation period. We compared the EMRs of the

83 patients with OKQ smart phrase documentation with a comparator population of 100 randomly selected patients flagged for screening with “REPROHEALTH” but without OKQ documentation in the visit note. We excluded four of these comparator charts from analysis because they represented duplicate visits or appointment no-shows. For the 96 patients without OKQ



**Figure 2.** Topics documented as discussed by providers, stratified by provider sex and by reproductive health screening type: One Key Question (OKQ) (n = 83), reproductive health screen without OKQ (n = 18), and no reproductive health screening (n = 78).

**Table 1.** Characteristics of patients from chart review who were screened using OKQ, who were screened without OKQ, and who did not have their reproductive health preferences assessed

Characteristics	OKQ used (n = 83)	OKQ not used but reproductive health intention screening performed (n = 18)	No OKQ or reproductive health preference screening (n = 78)	<i>P</i> <sup>a</sup>
Age, mean years (SD)	33.3 (7.0)	31.8 (8.9)	37.0 (9.3)	0.22
High-risk medication use, <sup>b</sup> n (%)	38 (46.9)	6 (33.3)	27 (34.6)	0.22
Rheumatic disease, <sup>c</sup> n (%)				0.92
Rheumatoid arthritis	28 (33.7)	7 (38.9)	23 (29.5)	
Lupus	23 (27.7)	6 (33.3)	26 (33.3)	
Antiphospholipid syndrome	3 (3.6)	3 (16.7)	2 (2.6)	
Mixed connective tissue disease	4 (4.8)	0	3 (3.9)	
Psoriatic arthritis	4 (4.8)	0	6 (7.7)	
Ankylosing spondylitis	5 (6)	0	3 (3.9)	
Other inflammatory arthritis	5 (6)	1 (5.6)	5 (6.4)	
Other	14 (16.9)	4 (22.2)	12 (15.4)	
Rheumatologist sex, n (%)				<b>0.007</b>
Male	14 (16.9)	5 (27.8)	29 (37.2)	
Female	69 (83.1)	13 (72.2)	49 (62.8)	
Type of contraception, <sup>d</sup> n (%)				<b>&lt;0.0001</b>
Highly effective methods	29 (34.9)	5 (27.8)	12 (15.4)	
Other methods	30 (36.1)	1 (5.6)	9 (11.5)	
Unknown	3 (3.6)	5 (27.8)	53 (68)	
None	21 (25.3)	7 (38.9)	4 (5.1)	
OB/GYN referral, n (%)	10 (12.1)	1 (5.6)	0	<b>0.003</b>

Note: Statistical significance was defined as  $p < 0.05$ .

Abbreviations: OB/GYN, obstetrics and gynecology; OKQ, One Key Question.

<sup>a</sup>*P* values compare OKQ (column 2) and reproductive health screening without OKQ (column 3) vs. no screening (column 4).

<sup>b</sup>Medications included cyclophosphamide, methotrexate, mycophenolate mofetil and Myfortic, and leflunomide.

<sup>c</sup>Not mutually exclusive categories; "other inflammatory arthritis" includes unspecified inflammatory arthritis, inflammatory bowel disease-associated arthritis, and other spondyloarthropathies.

<sup>d</sup>Highly effective methods included intrauterine devices, implant, Depo Provera, or male or female sterilization. Other methods included oral contraceptives, barrier method, NuvaRing, or patch.

documentation, 15 providers (67% female) documented pregnancy intentions (without the OKQ smart phrase) for 18 of 96 patients (19%).

Patients seen by female rheumatologists had 2.42 times higher odds of being screened, either with or without OKQ (95% confidence interval [CI] 1.21-4.85), with adjustment for patient age. Female providers also documented a broader range of reproductive health topics compared with male providers (Figure 2). After we adjusted for provider sex, a 1-year increase in patient age was associated with 5.4% lower odds of screening (odds ratio 0.946, 95% CI 0.91-0.98). Individuals who were screened were more likely to have highly effective birth control documented ( $P < 0.0001$ ; Table 1). Although use of a high-risk medication was not associated with greater likelihood of screening ( $P = 0.22$ ), rheumatologists who screened their patients were more likely to document reproductive risks of prescribed teratogenic medications ( $P < 0.0001$ ). Compared with those who screened without OKQ, providers who screened patients using OKQ were more likely to document a specific contraceptive method, and a higher percentage of the patients were referred to OB/GYN.

## DISCUSSION

The American College of Rheumatology (ACR) recently published reproductive health guidelines for patients with rheumatic conditions (16). These guidelines emphasize the importance of conducting pregnancy intention screening when treating reproductive-aged women with SRD. They recommend that this screening occur at an "initial or early visit and periodically thereafter, and always when initiating treatment with potentially teratogenic medications" (16). Specifically, they suggest using OKQ to discuss family planning with patients.

Our study, conducted prior to the guideline release, demonstrated the feasibility of implementing a pregnancy intention screening tool in a high-volume academic rheumatology practice. Using a survey and a simple EMR smart phrase template, we identified apparent differences over time in overall provider comfort and perceived barriers to screening and important provider and patient predictors of reproductive screening. Although overall uptake of OKQ was low, we did observe that a subset of providers who did not use OKQ did assess pregnancy intentions using other approaches, possibly in part because of the screening

reminder flag in patients' charts. When OKQ specifically was used, contraceptive methods were more clearly documented and referrals to OB/GYN were more frequent. Consistent with the goals of this effort, fewer rheumatologists felt that pregnancy intention screening was out of their scope of practice or too sensitive of a topic, and perceived barriers to OB/GYN referrals were reduced. Not surprisingly, we did not observe improvements in knowledge about contraception or counseling about specific contraceptive options because extensive training on these topics was not provided. Similarly, although overall comfort increased, discussion of specific steps to prepare for pregnancy did not, highlighting a potential gap in the training provided.

We noted that female rheumatologists compared with male rheumatologists were more likely to provide reproductive screening and to document a broader range of reproductive health topics. Prior studies have also suggested that female rheumatologists may be more knowledgeable about contraceptive methods compared with male rheumatologists (17). Interestingly, we observed that use of a teratogenic medication was not associated with pregnancy intention screening. As we consider the broader implications of this study, it is interesting to note that in the study by Clowse et al (11), although almost all rheumatologists identified methotrexate as a teratogen, only 69% and 37% correctly identified cyclophosphamide and mycophenolate as teratogens, respectively. These findings suggest that gaps in pharmacological knowledge may be an important barrier to comprehensive reproductive care provision for some rheumatologists.

During the 6-month period following the introduction of this tool, documentation of the OKQ smart phrase was rare and predominately occurred soon after it was introduced to the rheumatologists. This finding of limited uptake gives insights into how to make future efforts more effective. For example, rather than a text-only reminder flag, an EMR-based interactive prompt with the specific screening question that appears as soon as the chart is opened by a provider during a visit may better trigger completion. Our strategy was rheumatologist facing, but uptake may be improved if medical assistants do the initial screening at the time of triage and provide the response to the rheumatologist for more extensive discussion. It is also plausible that more extensive training on the use of a pregnancy intention screening tool may increase uptake. Because of the time constraints of physicians and the lack of a tailored OKQ training to the needs and expertise of rheumatologists, the standard 4- to 6-hour Power to Decide training was not used. Rather, the tool was introduced during a 1-hour division-wide lecture by OB/GYN providers to rheumatologists with a focus on the unique reproductive health needs of individuals with rheumatic conditions. Further studies are needed to determine whether rheumatologists would engage with a more in-depth training session and whether it would improve uptake and outcomes.

There were several limitations to this study. We did not have an interactive EMR-based prompt to alert providers to

screen their patients, which might have contributed to low uptake. In a prior study, EMR integration of OKQ resulted in higher rates of contraceptive counseling (12). In addition, patients were manually identified as having SRD, which required significant effort and was subject to misclassification, highlighting the need for an automated approach going forward. Our hospital system uses Epic as our EMR, and therefore our approach and findings may not be broadly generalizable. However, this project relied predominately on manual entries rather than automatic prompts, and Epic-specific functionalities were not used. Beyond the randomly selected patients flagged for chart review, we could not describe how many patients were screened for pregnancy intentions without use of the OKQ smart phrase versus how many were not screened at all. By design, our focus on formal referrals to OB/GYN within our system would have failed to capture referrals back to primary care for further discussion of contraception, potentially underestimating the impact of our initiative. Pre- and postimplementation surveys of providers were not linked at the individual level because the survey was anonymous to protect subject confidentiality in the work setting, resulting in us being unable to test statistically for individual-level change in provider comfort with screening practices. In addition, the short duration of our pilot did not allow for assessment of longer-term outcomes, such as healthy deliveries, or adverse outcomes averted. Since the design of this pilot initiative, several studies have demonstrated mixed efficacy of OKQ as a screening tool. One study comparing pre- with post-OKQ implementation showed increased patient satisfaction but did not show a statistically significant increase in reproductive counseling in the primary care setting (13). Although another study did demonstrate significantly higher rates of clinician counseling about contraception after OKQ implementation, especially after EMR integration, (12) a third study demonstrated low OKQ uptake and no significant change in contraceptive counseling rates (18). A robust multicenter randomized controlled trial would be useful to evaluate the impact of OKQ on both short-term process measures and long-term outcomes.

Although providers noted significantly fewer barriers to reproductive care after implementation of this tool, less than 10% of reproductive-aged AFAB patients with SRD were screened using OKQ, and less than 20% of an eligible subset of patients were asked selected reproductive health-related questions not using OKQ. Although provider screening behavior might have improved in a manner not captured by chart review, documentation of intention screening remained low. Patients and providers are increasingly interested in the incorporation of pregnancy intention screening and counseling into rheumatologic practice (10,19). Further investigations should explore both patient and provider satisfaction with pregnancy intention screening tools, and whether integration of a screening prompt into the EMR achieves higher uptake. It will be important to assess how the ACR guidelines for the management of reproductive health in

rheumatic diseases affect screening and to identify ongoing opportunities for improvement (16).

## AUTHOR CONTRIBUTIONS

All authors were involved in drafting the article or revising it critically for important intellectual content, and all authors approved the final version to be published. Drs. Janiak and Feldman had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

**Study conception and design.** Pryor, Albert, Desai, Ritter, Tarter, Coblyn, Bermas, Dutton, Pace, Janiak, Feldman.

**Acquisition of data.** Pryor, Janiak, Feldman.

**Analysis and interpretation of data.** Pryor, Bermas, Santacroce, Braaten, Pace, Rexrode, Janiak, Feldman.

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