Arthritis Care & Research
Vol. 68, No. 4, April 2016, pp 415–423
DOI 10.1002/acr.22689

ORIGINAL ARTICLE

Rheumatologist and Primary Care Management of Cardiovascular Disease Risk in Rheumatoid Arthritis: Patient and Provider Perspectives

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Objective. **Despite increased cardiovascular disease (CVD) risk, rheumatoid arthritis (RA) patients often lack CVD preventive care. We examined CVD preventive care processes from RA patient and provider perspectives to develop a process map for identifying targets for future interventions to improve CVD preventive care.**

Methods. **Thirty-one participants (15 patients, 7 rheumatologists, and 9 primary care physicians [PCPs]) participated in interviews that were coded using NVivo software and analyzed using grounded theory techniques.**

Results. **Patients and providers reported that receipt of preventive care depends upon identifying and acting on risk factors, although most noted that both processes rarely occurred. Engagement in these processes was influenced by various provider-, system-, visit-, and patient-related conditions, such as patient activation or patients' knowledge about their risk. While nearly half of patients and PCPs were unaware of RA-CVD risk, all rheumatologists were aware of risk. Rheumatologists reported not systematically identifying risk factors, or, if identified, they described communicating about CVD risk factors via clinic notes to PCPs instead of acting directly due to perceived role boundaries. PCPs suggested that scheduling PCP visits could improve CVD risk management, and all participants viewed comanagement positively.**

Conclusion. **Findings from this study illustrate important gaps and opportunities to support identifying and acting on CVD risk factors in RA patients from the provider, system, visit, and patient levels. Future work should investigate professional role support through improved guidelines, patient activation, and system-based RA-CVD preventive care strategies.**

INTRODUCTION

Although rheumatoid arthritis (RA) independently increases cardiovascular disease (CVD) risk (1–4), many RA patients receive suboptimal CVD preventive care (5–8). We and others have reported disparities in lipid, diabetes mellitus, and hypertension care among RA patients compared to peers (5,7,9–12). Mortality and care gaps continue (13–15) despite published recommendations for RA-CVD risk management by the European League Against Rheumatism (EULAR), global experts, and other professional societies (16–18). In one survey, only 32% of primary care providers (PCPs) were aware of RA-mediated CVD risk (19). In another, only 31% of rheumatologists were willing to treat hypertension (20), although they were aware of the risk. Lack of knowledge by PCPs and the rheumatologists' lack of action likely both contribute to CVD preventive care gaps in RA. Understanding the process and barriers to delivering CVD preventive care is critical to improve care, reduce CVD, and increase longevity for RA patients.

Qualitative research is an ideal method to investigate complex health care processes to inform interventions (21–23). By using qualitative methods, rather than fixed quantitative measures such as surveys, investigators can critically examine perceptions and actions to map health care processes and barriers more deeply. For example, following many failed congestive heart failure self-management trials, a qualitative

The contents of this article are solely the responsibility of the authors and do not necessarily represent the official view of the NIH.

Supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases/NIH (grant K23-AR-062381 to Dr. Bartels) and by the University of Wisconsin Institute for Clinical and Translational Research (ULTR000427). Dr. Roberts' work was supported by the William S. Middleton Veterans Affairs Hospital. Dr. Gilmore's work was supported by the William S. Middleton Veterans Affairs Hospital and the National Hartford Centers of Gerontological Nursing Excellence.

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Submitted for publication September 25, 2014; accepted in revised form August 11, 2015.

Significance & Innovations

- Despite higher cardiovascular disease (CVD) risk in rheumatoid arthritis (RA), research has shown lower rates of preventive care, which motivated this first qualitative study examining RA patients', primary care providers' (PCPs), and rheumatologists' experiences of CVD prevention.
- Addressing RA-CVD risk required both identifying risk factors and taking action, which rarely occurred.
- Many RA patients and PCPs lacked knowledge regarding increased CVD risk in RA, while rheumatologists were aware but lacked systematic monitoring (vigilance) or action beyond clinic note comments.
- Future work should target barriers to CVD prevention in RA identified in this research, including gaps between rheumatologist and PCP care, by leveraging patient activation and system-based strategies to identify and act on CVD risk factors in RA patients.

study illustrated population-specific gaps in recognizing symptoms and knowing who to call (24). These findings informed the successful tailoring of interventions. Another study that investigated patients' decisions to take antihypertensive medications (25) informed adherence questionnaires (26), interventions, and guideline recommendations (27,28).

Our objective was to examine barriers and facilitators to CVD preventive care delivery from the perspectives of RA patients, PCPs, and rheumatologists. We aimed to develop a preventive care processes map of modifiable targets to close CVD prevention gaps for RA patients.

PATIENTS AND METHODS

Study sample. Using posters and letters, we recruited 15 adult RA patients from 3 rheumatology clinics to discuss "teamwork and heart health in RA." Inclusion criteria were a diagnosis of RA and having a rheumatologist and a PCP. We invited 11 PCPs via e-mail, each representing different rural and urban clinics, and 9 participated. We invited a total of 9 rheumatologists from 3 clinics in the same large academic multispecialty group, and 7 participated. These rheumatologists served the patients interviewed for this study, but the PCPs did not. Providers were invited to discuss "collaboration" and "CVD prevention in RA" in <1-hour interviews. All participants received honoraria.

The study was reviewed by the Minimal Risk Institutional Review Board and deemed exempt under category 45 CFR 46.101(b). Participants provided verbal informed consent for recorded interviews.

Data collection and methodology. We used the chronic care model (29) and grounded theory principles (23,30–32) to inform study methodology. Grounded theory allowed us to inductively identify processes and "conditions" (i.e., the contingencies that influence the process under study) to improve the process (23,32). We selected this methodology for its ability to map concepts using a systematic approach.

Interview questions addressed several topics that evolved during analysis, which is consistent with grounded theory (30,31). We asked patients questions about their perceptions of individual provider roles, their experiences of preventive care and risk factor discussions, and their awareness of the increased CVD risk in RA. We asked all PCPs and rheumatologists about their approaches to preventive care, collaboration, and their awareness of CVD risk in RA. For example, all providers responded to the question, "How do you think about preventive care for a patient with RA?" Later we asked providers, "What influences who is responsible for preventive care for a patient with RA?" At interview completion, we invited open-ended advice from patients, PCPs, and rheumatologists on how to improve CVD preventive care in RA. Additional interviews continued until data saturation was reached, i.e., when participants provided no new approaches to delivery of preventive care in RA (31,33). Individual face-to-face interviews lasted an average of 38 minutes (range 26–66 minutes). They were audio recorded and transcribed verbatim to assure data accuracy and facilitate coding.

Statistical analysis. Each transcript was independently coded by 2 reviewers using NVivo software, and then reviewed by our multidisciplinary study team. Analysis occurred iteratively, impacting subsequent sampling and questions consistent with grounded theory (30,32). Analysis involved 3 levels of coding followed by mapping (32). The first level involved line by line analysis to identify processes that patients and providers describe engaging in for preventive care. Each process was assigned a code. For example, descriptions of passing forward health risk information to another provider or the patient were coded as "transferring." The second level involved identifying

Table 1. Characteristics of interviewed RA patients (n = 15)*

Characteristic	Value
Female	67
Age, years	56 (23–81)
Married	60
White race	93
Education	
≤ High school	20
Any post–high school	80
RA duration, years	19 (8–38)
Prior diabetes mellitus	13
Prior CVD/TIA/stroke	27
Tobacco use (ever)	50
Hypertension	40
High cholesterol (ever)	67
Annual provider count	5 (3–20)
Annual visit count	13 (4–30)
Annual rheumatology visits	4 (2–6)
Annual PCP visits	2 (0–5)

* Values are the percentage or the mean (range). RA = rheumatoid arthritis; CVD = cardiovascular disease; TIA = transient ischemic attack; PCP = primary care provider.

Table 2. Characteristics of interviewed providers (n = 16)*

Characteristic	Primary care (n = 9)	Rheumatology (n = 7)
Female	63	40
Years in practice	21 (8–38)	15 (2–28)
Clinical FTE	0.7 (0.3–1)	0.6 (0.2–1)
Internal medicine	44	NA
Family medicine	56	NA
Estimated RA patients/month	2 (0–4)	57 (14–120)
Any prior clinical experience in other health systems	33	70

* Values are the percentage or the mean (range). FTE = full time equivalent; NA = not applicable; RA = rheumatoid arthritis.

conditions (i.e., contingencies that influence the process under study) that influenced those processes. For example, professional role boundaries influenced transferring high blood pressure findings, as several rheumatologists reported perceiving that management was a PCP and not rheumatology role, and so they sent notes to PCPs without acting further. The third level involved identifying the processes that were core across participants and code categories. For example, identifying and acting on risk factors were deemed the core processes per shared experiences of all patients and providers.

Next, codes representing the reported conditions, strategies (such as "transferring" versus directly managing risk factors), and consequences were fit within a map. Relationships among coded concepts came directly from patient quotes, probing questions regarding causality, and inferences from frequent co-occurrence in text. Conceptual process maps were reviewed with later patient and provider interviewees to ensure that researchers interpreted the data as consistent with participant experiences (32).

RESULTS

A total of 31 participants were interviewed. Among 15 interviewed RA patients, 67% were female, with a mean age of 56 years (range 23–81 years) (Table 1). RA patients recalled 13 (mean) total provider visits annually. Nine PCPs (4 internal medicine and 5 family medicine) from separate clinics, and 7 rheumatologists from 3 rheumatology clinics in an academic physician group, were interviewed (Table 2). Rheumatologists estimated seeing 57 RA patients monthly; PCPs estimated seeing only 2. Most RA patients and nearly half of PCPs were not aware of any CVD risk associated with RA, while all rheumatologists were aware of this heightened risk.

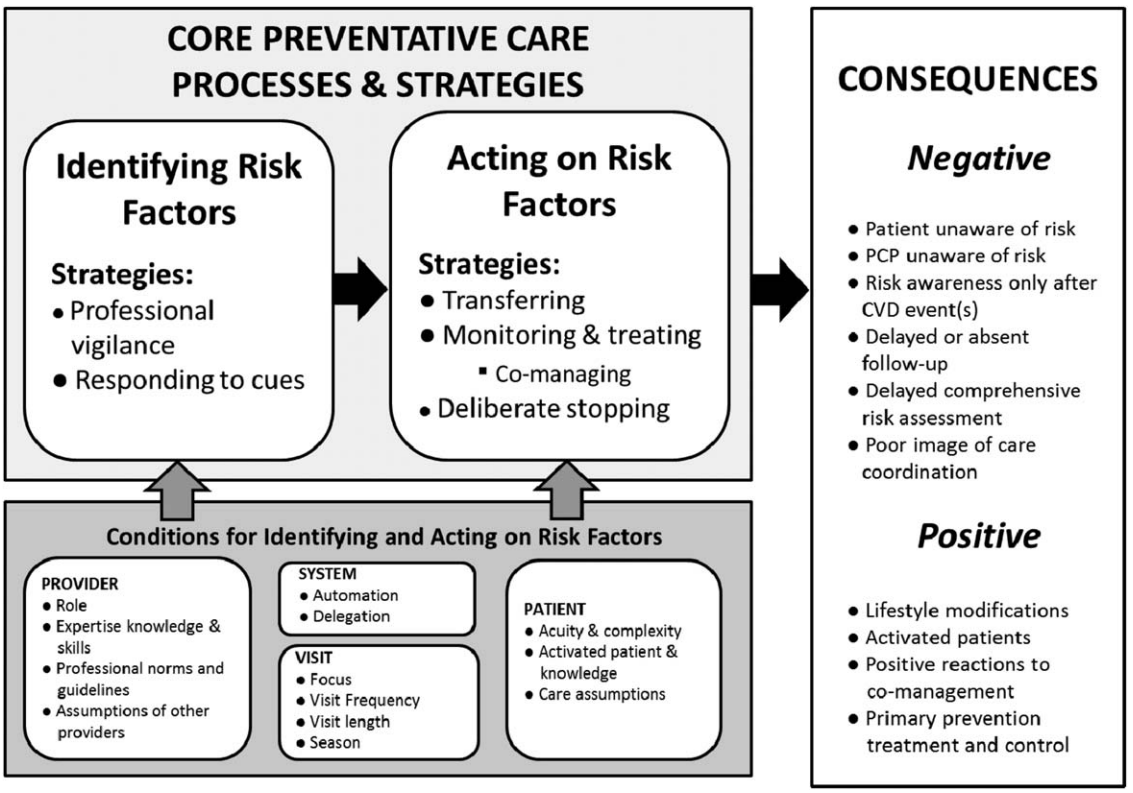

Figure 1. The Preventive Care Process Map in Rheumatoid Arthritis (RA). The process map was derived from interviews regarding the conditions, process steps, and strategies impacting preventive care delivery in RA patients, including RA cardiovascular disease (CVD) prevention. The right panel shows the reported positive and negative consequences of current process for RA-CVD prevention, according to RA patients and their providers. PCP = primary care provider.

Table 3. Processes and strategies for preventive care delivery*

Category/description	Quotations
Identifying risk factors	
Professional vigilance: Provider's attention and alertness to seek and review information or knowledge about a patient's risk	"You can pretty easily see the past 3 blood pressures…I always go to my assessment and recommendations before I see someone again [and look at] the 3 points in my assessment and if hypertension was one of them, I would probably be a little more vigilant the next time." (rheumatologist)
Responding to cues: Providers respond to a signal to identify risk, facilitate memory, or trigger risk identification	"If I smell smoke on them, I definitely bring up tobacco…They get their blood pressure every time…but otherwise we don't usually have time to have a long conversation…If I notice their blood pressure is high before we leave then we talk about it." (rheumatologist)
Acting on risk factors	
Transfer: Responsibility for risk factor management is passed to patient or alternate provider	(Transfer to provider) "In my note to the referring…primary care provider, I do list the reasons I'm concerned, and, and explain the risk between these inflammatory diseases and cardiovascular risk." (rheumatologist) (Transfer to patient) "I usually have them [patients] see their primary care doctors for that [BP] because I'm not gonna be able to follow them for it, adjust the medications, or…decide if they should be treated with medications or counseling. So, I discuss it, but I tell them to bring it up with their primary doctor." (rheumatologist)
Monitor and treat: Provider reviews data about ongoing risk factors or treatment response and initiates or changes treatment plan	"So she (PCP) ended up putting me on a statin…so I'm on a statin right now, and um it's been re-checked and it's now… my lipids are good." (patient)
Co-manage: Providers jointly manage risk monitoring and treatment	(Co-manage) "I am really trying to, as a primary care doctor, work on…the importance of preventing cardiovascular disease… and the increased risk with these inflammatory conditions…So I think that's a good co-manage thing, where the rheumatologist can stress that, and then I can keep going with it." (PCP)
Deliberately stopping: After risk is considered, there is no further action	"And sometimes it's (EHR preventive care alerts) helpful, but frankly, many times it's annoying. Because you're like, 'Nope. I don't have time to address that today!'" (PCP)

* BP = blood pressure; PCP = primary care provider; EHR = electronic health record.

Conceptual analysis of interviews illustrated that receipt of CVD prevention or other preventive care depended upon 2 core processes: 1) identifying risk factors (e.g., RA patients' elevated CVD risk or elevated blood pressure) and 2) acting on risk factors as shown in the process map in Figure 1. Participant descriptions of providing or receiving a range of CVD and non-CVD prevention tasks (e.g., lipid testing, blood pressure followup, immunizations, and bone health screening) informed the process map development. As shown, provider, system, patient, and visit conditions could impact risk factor identification and action.

Identifying risk factors. Our analysis suggested that identifying risk factors was the first process step (Figure 1) wherein patients or providers recognized or drew attention to CVD risk or other prevention needs. PCPs and rheumatologists described identifying risk factors using 2 strategies: professional vigilance and responding to cues indicating risk. Definitions and quotations illustrating the processes of identifying risk factors and acting are detailed in Table 3.

Professional vigilance. Professional vigilance was a proactive process in which providers actively sought and purposefully reviewed health markers to identify CVD risk. For example, some providers regularly reviewed blood pressures charted over several visits to identify whether hypertension was present.

Responding to cues. Responding to cues was the second strategy participants reported to identify risk factors. Potential cues for identifying risk factors included 1) the season of the visit (e.g., autumn visits prompted influenza risk identification), 2) patient physical cues (e.g., tobacco smell), and 3) provider actions (e.g., prescription of steroids and glucose testing). Most of these cues were nonsystematic and informal.

No PCPs or rheumatologists routinely used CVD risk calculators to evaluate CVD risk and initiate risk discussions with RA patients. PCPs described sporadic use of CVD risk calculation in practice, which was even less likely in RA patients: "Well sometimes the patient is saying, 'Well should I really start a statin or not?' And I say, 'Well let's take a look [calculate]…' But I, maybe I do that every twentieth or thirtieth patient." When asked who would trigger vigilant CVD risk assessment, another PCP commented: "Primarily it would be folks who either have high blood pressure, or hyperlipidemia or, diabetes…history of cancer, radiation…Admittedly, I have a handful of people

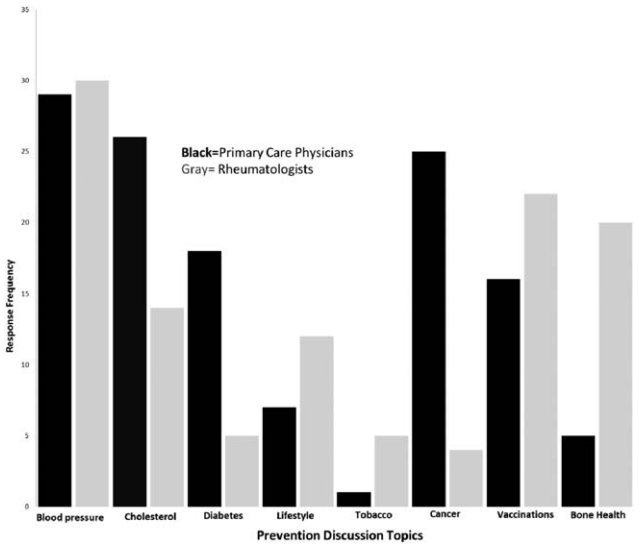

Figure 2. "Response frequency" indicates the proportion of comments by primary care providers (PCPs) or rheumatologists who spontaneously reported a focus on preventive care topics summarized above. Response numbers were proportionally scaled to reflect 9 PCPs and 7 rheumatologists. Topics are on the x-axis, and the y-axis scales the number of coded quotations by group. Note that because of the study's focus on prevention of cardiovascular disease in patients with rheumatoid arthritis, all providers were asked about their vigilance to and management of hypertension. "Lifestyle" counted diet, exercise, and weight discussions.

who have rheumatoid arthritis. . .I probably am not as good at targeting those folks." Most PCPs reported using the same approach for RA patients and general risk patients.

Providers were more vigilant and responsive to cues when they perceived a particular risk factor as within their role and expertise (Figure 1). Figure 2 shows that PCP and rheumatologists varied on topics they discussed and vigilantly screened. Rheumatologists often reported professional vigilance for preventing infections and osteoporosis, saying they prescribed medications causing these conditions and followed rheumatology guidelines. Rheumatologists acknowledged low vigilance to RA-CVD risk factors, citing unclear roles and lack of clear guidelines or expertise. One rheumatologist articulated, "We've got the rheumatologist who's way out of date with guidelines for high blood pressure, lipids and we've got a busy clinic with complicated patients. . .am I really equipped to handle that kind of thing?"

Acting on risk factors. If individual CVD risk factors were identified or RA-CVD risk was discussed, the next step in the preventive care process was acting on risk factors (Figure 1). Providers used strategies to act on risk factors, including 1) transferring the responsibility for action, 2) directly monitoring and treating, or 3) deliberately stopping, meaning intentionally not acting on the risk factor (Table 3). Choice of strategy was again linked to the provider's perception of role and expertise.

Transferring. When a CVD risk factor was identified, rheumatologists often reported acting by transferring responsibility for the risk factor to PCPs versus managing it themselves (Table 3). Transfers occurred when rheumatologists felt that diagnosis or treatment of a CVD risk was outside their role or expertise. Rheumatologists often voiced concerns about overstepping boundaries and hesitated to prescribe antihypertensive medicine, for instance. As one rheumatologist said, "To me there's a reluctance, if I start a blood pressure pill in somebody whose blood pressure is 189/110 . . .that's really out of the scope of my practice." Others cited that poor knowledge of current CVD guidelines and vague RA-specific recommendations drove transfers. PCPs did not vocalize role boundary concerns, though some mentioned difficulty in knowing specialty-specific recommendations.

Rheumatologists reported transferring responsibility to the PCP or patient via verbal or written communication. For example, rheumatologists sent progress notes to PCPs, pointing out elevated blood pressures. Some reported occasionally sending notes mentioning cholesterol testing needs, or educating PCPs about RA-CVD risk, to transfer knowledge and responsibility. PCPs were uniformly negative while describing specialist transfers via referring to another specialist, rather than back to the PCP, for something within the scope of practice of the PCP.

Monitoring and treatment. Directly monitoring and treating RA-CVD risk factors was the second strategy for acting on risk factors. Direct treatment and monitoring occurred when providers felt clear about their role and had the requisite expertise (knowledge and skills) to do so. Participants generally reported that PCPs were more likely to directly treat and monitor traditional CVD risk factors because of their responsibility for preventive care. Some rheumatologists identified risk factors and acted by advocating tobacco cessation, exercise, diet, and healthy lifestyle or encouraged patients to work with their health care teams on such issues.

Providers who felt comfortable contacting one another through familiarity or "shared" patients (conditions) were sometimes described as "co-managing," working together on CVD prevention. For example, some patients and providers positively described collaborative decisions, via phone or e-mail, by PCPs and rheumatologists about prophylactic aspirin treatment or lipid management.

Deliberate stopping. Deliberately stopping, or intentionally not acting on risk factors, was the final provider action described (Table 3). There were rare examples of deliberate stops in CVD preventive care due to patients being deemed low risk, young, or fit. However, more examples described stopping due to competing demands or gaps. Providers reported they stopped action when they had unclear roles, lacked expertise to directly treat and monitor, or attributed responsibility to another provider. One RA patient with diabetes mellitus reported seeing 8 different providers annually and laughed when describing stopped action despite repeated identification of elevated blood pressures at several specialty visits: "Most of the time they'll say, 'Oh must be white coat syndrome.' That's how they all deal with it." Patients with multiple providers discussed gaps in responsibility that stopped action.

Conditions for identifying and acting on risk factors. *Provider conditions.* Both PCPs and rheumatologists reported that provider role perceptions, knowledge, pro-

Table 4. Conditions for preventive care delivery*

Category/description	Examples	Quotations
Provider conditions		
Provider level	Role, expertise, professional norms, assumption of other providers	"When I see RA patients, I'm always asking about whether they are seeing their primary regularly and, addressing cardiovascular risks. . .things that need to be done in a primary care setting." (rheumatologist)
System conditions		
System level: health care system processes and tools to help identify and manage risk	Priority delegation for MA workflows, EHR automation, system training and feedback priorities	"We did this thing where. . . every time the patient had an elevated BP >140, they (MA/RN) give the resident a card so they'd know to look at the BP." (PCP)
Visit conditions		
Visit level: purpose of scheduled visit and number of visits with provider	Time constraints, acute care visits, health care maintenance visits, visit frequency	"When you have a patient who's got an actual medical problem and. . .a lot of information that needs to be gathered . . . there's. . .going to be less time to look at prevention." (rheumatologist)
Patient conditions		
Acuity and complexity: immediacy and severity of needs, or combination of needs	Patient has multiple health problems, focus on their most active health problems	"A primary care doctor sees them, they've been sick, they're in pain, they're having. . .a lot of complications from their RA. . .we get 20 minutes . . . diversion of other illnesses and then you know, hypertension is silent." (PCP)
Activated-patient: a patient with the knowledge, skills and confidence to manage own health and health care	Self-educated patients ask, make lifestyle changes, patient pushes provider for care	"Heart health. . .that's something that I had brought up with (rheumatologist) having rheumatoid and. . .with so much research that's coming out now with heart disease that's so linked with rheumatoid. . .." (patient)
Care assumptions: patient beliefs regarding care delivery	Provider roles, provider vigilance, testing/monitoring, relational	Interviewer: "Does Dr. (rheumatologist) ever talk to you about. . .your blood pressure or cholesterol follow up?" Patient: "Well he doesn't talk about it but he looks at it." (patient)

* RA = rheumatoid arthritis; MA = medical assistant; EHR = electronic health record; RN = registered nurse; BP = blood pressure; PCP = primary care provider.

fessional guidelines, or norms were conditional facilitators or barriers for identifying and acting on risk factors (Figure 1 and Table 4). Additionally, providers mentioned assumptions regarding the roles of fellow providers by role or familiarity working together. For example, some PCPs assumed rheumatology would screen for osteoporosis due to expertise in bone and use of steroids; rheumatologists assumed PCPs would manage CVD risk factors like blood pressure or cholesterol due to their expertise and focus on preventive care.

System conditions. System-based strategies also helped providers identify CVD risk factors (Figure 1 and Table 4). Automated risk identification or delegating action were ways that systems supported identifying risk factors and acting on CVD risk factors. For example, PCPs described that publically reported diabetes mellitus metrics led to automated alerts that cued overdue hemoglobin A1C tests. Medical assistants and nurses reviewed cues and were delegated authority to place orders for A1C tests, which structured both vigilance and taking action.

While PCPs provided examples of systems for risk identification and action, examples of CVD risk management in RA were far less systematic. Few rheumatologists asked staff to "flag" elevated blood pressures or used automated tools to review blood pressure trends. No rheumatologists described delegation protocols or systems for CVD preventive care in RA. Likewise, given the rarity of RA encounters, most PCPs were disinterested in systems-based CVD prevention interventions specifically for RA patients.

Visit conditions. Participants reported that the focus of a visit could also impact identification of CVD risk (Figure 1 and Table 4). Both patients and PCPs discussed that preventive care was more likely to occur in annual health maintenance visits, given differences in visit length and focus, versus being overlooked entirely during problem-focused visits. Unfortunately, no formal mechanism existed to identify overdue health maintenance visits. Both PCPs and patients reported that RA patients had rare primary care visits. PCPs asked rheumatologists to "send patients back" for PCP visits to focus on CVD risk factors.

Patient conditions. Providers and patients reported that patient acuity, complexity, activation, and assumptions could be barriers or facilitators for identifying and acting on risk factors. Acuity and complexity of RA could shift attention away from identification of RA-CVD risk. It was reported that patients' with uncontrolled RA at visits focused on their disease, not preventive care. Patient knowledge and "activation" also influenced risk identification and action.

Almost half of risk-aware patients had learned about their disease independently. These "activated" patients could achieve action by initiating discussions and self-advocating for risk factor treatment (Figure 1 and Table 4). Others learned about RA-CVD risk from their rheumatologist and advocated for treatment with their PCP. No patients reported learning about RA-specific CVD risk from their PCP.

Patients also had assumptions about their health and care team that influenced CVD risk identification and action. Patients sometimes described assuming that all physicians would address any topic at any visit. For example, one patient stated, "I guess because I have it [blood pressure] done twice a year in rheumatology and it's entered into the computer... they would say if I had a problem." Others assumed that routine blood tests to monitor rheumatology medications would include preventive laboratory tests such as lipid levels. Most patients considered their rheumatologist as their "main provider," and several did not seek PCP input about health care maintenance, including CVD prevention. A few RA patients could not even name their PCP.

Consequences. *Negative consequences.* In the absence of both professional vigilance and cuing, gaps in risk factor identification were reported consequences (Figure 1). Half of patients recalled no prior discussions with their rheumatologists regarding exercise, diet, blood pressure, cholesterol, tobacco, or weight loss. Rheumatologists voiced awareness of RA-CVD risk, but hesitancy as to whether CVD risk factors fell within their role limited their vigilance. Many PCPs did not voice awareness that RA increased CVD risk. Furthermore, all participants reported that infrequent PCP visits with RA patients limited even traditional CVD prevention efforts. Even after a CVD event, RA-CVD risk was often overlooked, as illustrated by an RA participant with a transient ischemic attack in her 40s and another patient whose RA-CVD connection was made only after 2 myocardial infarctions in his 50s.

Patients reported several instances of being told to "followup" after an elevated BP at a specialist visit, i.e., responsibility was transferred to them. They described that directions were too vague, thereby creating another opportunity for care gaps. Rheumatologists did not express awareness of consequences or failures of such transfers.

Positive consequences. Some positive consequences existed, especially for activated patients. Some reported lifestyle modifications after discussions with their providers. Likewise, most patients and providers generally described the experience of co-management positively, describing higher satisfaction and perceived treatment effectiveness.

DISCUSSION

Our study offers potential explanations for prior reports documenting low lipid testing and lower hypertension diagnosis in RA patients compared to their peers (5,9,11). Moreover we offer the first map of unique process gaps, conditions, and strategies that demonstrates how that occurs. The map extends classic chronic care models (29) by including multiple provider roles and transferring. Our findings suggested that both identifying risk factors and acting on risk factors were necessary to modify CVD risk in RA patients, but both rarely occurred. Three things reportedly occurred: 1) CVD risk was not identified, 2) risk was identified and transferred or not acted upon, or 3) both identifying and acting on risk factors sometimes occurred through co-management. Neither PCPs nor rheumatologists reported routine professional vigilance to RA-CVD risk. Additionally, few cues or systems supported routine identification of CVD risk factors. If CVD risk factors like high blood pressure were identified, rheumatologists reported that transferring the risk back to the PCP or patient via a clinic note was their most likely action.

Our findings illustrate several opportunities for improving CVD preventive care delivery for RA patients. These include improved professional guidelines or recommendations to define action steps for CVD risk management in RA (similar to glucocorticoid-induced osteoporosis or immunization recommendations for rheumatologists), more explicit transfer practices, and system-based CVD preventive care.

Professional guidelines, perceived roles, practice scopes, and expertise all shaped rheumatologists' willingness to be professionally vigilant and act on prevention topics like bone health and immunization versus CVD risk. One of the few multinational rheumatology society recommendations for CVD risk management in RA is the EULAR recommendation for annual comprehensive risk assessment and RA-CVD risk calculation using a risk modifier (16). In our study, very few PCPs and no rheumatologists routinely used CVD risk calculators, and RA patients were unlikely to be targeted. A recent systematic review noted poor specificity of several existing CVD prevention recommendations for RA (18). More specific professional guidelines could, for instance, recommend how often to perform primary lipid screening and outline new quality indicators for RA-CVD risk prevention to improve care quality. Clarifying parameters for individual risk factor screening and treatment goals could heighten professional vigilance and rheumatologist co-management over time.

Directed transfers, co-management, and system-based care could also support CVD preventive care for RA patients. Rheumatologists often used more passive transfer strategies, such as telling patients to followup or copying clinic progress notes to PCPs. In our study, PCPs reported that copied notes were ineffective in prompting action. This is consistent with reports on electronic information overload and known gaps in such communications (34,35). Instead, PCPs requested that rheumatologists "send patients back," thereby explicitly transferring by requesting PCP appointments to specifically address issues like hypertension or comprehensive CVD risk assessment. Notably, this health system did not have a cardio-rheumatology clinic; however, interviewed PCPs generally disliked specialists generating referrals to other specialists, suggesting they might object to such a referral. They favored co-management between current providers.

Rheumatologists were all aware of higher CVD risk in RA, and many RA patients saw their rheumatologist as their "main doctor." This relationship could be leveraged for care improvement, or clarified to get patients back to PCPs for prevention. Moreover, tobacco cessation, exercise, and weight reduction may benefit both RA and CVD risk (17),

yet these actions are not systematically supported in RA clinics. Tasks such as identifying and acting on elevated blood pressures have been successfully managed in primary care using hypertension protocols like those advocated by the Centers for Disease Control (36,37). Using staff protocols, rheumatology teams could address, or send patients back to address, risk factors such as elevated blood pressures, tobacco, or lapses in cholesterol testing to assist primary care medical "homes" with population management (38) as good "medical neighbors." For instance, we are piloting a modified hypertension protocol for rheumatology staff to confirm elevated blood pressures and schedule primary care followup. One could also envision a spring rheumatology clinic campaign to motivate patients to improve heart health and physical activity much like the autumn season cues rheumatology clinic efforts to promote vaccination.

To our knowledge, this is the first study encompassing patient, PCP, and rheumatologist perspectives in RA and CVD preventive care to extend beyond chronic-care models or primary care–centered CVD prevention (29). Study strengths include the application of systematic and rigorous methods, as well as the collection of perspectives of patients, PCPs, and rheumatologists. As with any study, we acknowledge some limitations. First, most observations stemmed from a single US academic setting, although 3 rheumatology group practices, 9 primary care groups, and a neighboring health maintenance organization were included. Findings may differ from other settings, yet they offer a framework for discussion. Lastly, our patient sample was generally insured, educated, and all English speaking. Still, we argue that poor performance in this group reflects poor performance in other populations with additional barriers.

In our study, patients, PCPs, and rheumatologists helped map processes to improve CVD prevention in RA. Care gaps included lack of professional vigilance, breakdowns between identifying and acting on risk factors, transfers, and deliberate stopping. Future studies should investigate ways to identify and act upon RA-CVD risk factors, including specific professional guidelines, directed transfers, activating patients, and system-based approaches to improve CVD preventive care in RA. Improving processes to identify and act upon CVD risk factors has strong potential to reduce CVD events and, importantly, to promote health and longevity in RA patients.

ACKNOWLEDGMENTS

The authors wish to thank Joanna Wong, Sarah Twedell, and Rebecca Burton for meticulous transcription and coding; Sarah Loring for manuscript support; and Drs. Kathy Oriel and Mae Hla for help with primary care physician recruitment.

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 submitted for publication. Dr. Bartels had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study conception and design. Bartels, Roberts, Bowers.
Acquisition of data. Bartels, Roberts, Maxcy.
Analysis and interpretation of data. Bartels, Roberts, Hansen, Jacobs, Gilmore, Bowers.

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