



Published in final edited form as:

*Am J Health Promot.* 2021 May ; 35(4): 559–570. doi:10.1177/0890117120981371.

## Physical Activity Assessment and Recommendation for Adults With Arthritis by Primary Care Providers—DocStyles, 2018

Dana Guglielmo, MPH<sup>1,2</sup>, Louise B. Murphy, PhD<sup>1</sup>, Kristina A. Theis, PhD<sup>1</sup>, Charles G. Helmick, MD<sup>1</sup>, John D. Omura, MD<sup>3</sup>, Erica L. Odom, DrPH<sup>1</sup>, Janet B. Croft, PhD<sup>1</sup>

<sup>1</sup>Division of Population Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

<sup>2</sup>Oak Ridge Institute for Science and Education, Oak Ridge, TN, USA

<sup>3</sup>Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

### Abstract

**Purpose:** To examine primary care providers' (PCPs) physical activity assessment and recommendation behaviors for adults with arthritis.

**Design:** Cross-sectional.

**Setting:** 2018 DocStyles online national market research survey of US physicians and nurse practitioners.

**Sample:** 1,389 PCPs seeing adults with arthritis.

**Measures:** 2 independent behaviors (assessment and recommendation) as 3 non-mutually exclusive groups: “always assesses,” “always recommends,” and “both” (“always assesses and recommends”).

**Analysis:** Calculated percentages of each group (overall and by PCP characteristics), and multivariable-adjusted prevalence ratios (PRs) using binary logistic regression.

**Results:** Among PCPs, 49.2% always assessed and 57.7% always recommended physical activity; 39.7% did both. Across all 3 groups, percentages were highest for seeing 20 adults with arthritis weekly (“both”: 56.4%; “always assesses”: 66.7%; “always recommends”: 71.3%) and lowest among obstetrician/gynecologists (“both”: 26.9%; “always assesses”: 36.8%; “always recommends”: 40.7%). Multivariable-adjusted associations were strongest for seeing 20 adults with arthritis weekly (referent: 1-9 adults) and each of “always assesses” (PR = 1.5 [95% confidence interval (CI): 1.3–1.8] and “both” (PR = 1.6 [95% CI: 1.4–1.9]).

**Conclusions:** Approximately 40% of PCPs sampled always engaged in both behaviors (assessing and recommending physical activity) with adults with arthritis; seeing a high volume

---

**Corresponding Author:** Dana Guglielmo, Centers for Disease Control and Prevention, 4770 Buford Hwy NE, MS 107-6, Atlanta, GA, 30341, USA. [Obx1@cdc.gov](mailto:Obx1@cdc.gov).

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

of adults with arthritis was consistently related to engaging in each behavior. Evidence-based approaches to support PCP counseling include offering provider education and training, raising awareness of available resources, and using health system supports.

### Keywords

primary care providers; physical activity assessment; physical activity recommendation; physical activity; arthritis

---

### Purpose

In the United States (US), more than 54 million adults have arthritis, which is a leading cause of disability.<sup>1,2</sup> It is also costly, with \$303.5 billion in combined arthritis-attributable medical expenditures and earnings losses in 2013.<sup>3</sup> Regular physical activity is an effective, low-cost, drug-free strategy for managing arthritis that can alleviate pain,<sup>4</sup> improve physical functioning,<sup>4</sup> prevent or delay arthritis-related disability,<sup>5</sup> and improve mental health.<sup>6,7</sup> The *Physical Activity Guidelines for Americans*, 2nd edition (Guidelines) recommend that adults, including those with chronic conditions like arthritis, do at least 150 to 300 minutes a week of moderate-intensity or 75 to 150 minutes a week of vigorous-intensity physical activity, or an equivalent combination, along with 2 days a week of muscle-strengthening activities.<sup>8</sup> The American College of Rheumatology and Arthritis Foundation also recommend physical activity as a priority strategy to reduce pain in people with hip and knee osteoarthritis.<sup>9</sup> Despite the numerous health benefits of physical activity, only 41.9% of US adults with arthritis are aerobically active (52.2% among adults without arthritis; both estimates are age-standardized).<sup>10</sup>

Adults with arthritis report needing and desiring provider support and guidance for physical activity and identify lack of communication with their provider as a barrier to physical activity.<sup>11–14</sup> Motivational interviewing by health care providers can modestly increase physical activity levels in adults with chronic health conditions.<sup>15</sup> The American Medical Association, the American College of Sports Medicine (ACSM), and American Heart Association support routine physical activity counseling for all patients.<sup>16,17</sup> ACSM's global initiative, Exercise is Medicine<sup>®</sup>, encourages providers to: 1) assess, prescribe, and track patients' physical activity levels; and 2) refer patients to evidence-based physical activity programs or fitness professionals to treat or manage a number of chronic conditions, including arthritis.<sup>18</sup>

Estimates from the population-based US National Health Interview Survey suggest that provider physical activity counseling for arthritis care is increasing.<sup>19</sup> From 2002 to 2014, the percentage of adults with arthritis reporting having ever received a provider's suggestion to engage in physical activity/exercise to manage their condition rose from 51.9% to 61.0%.<sup>19</sup> However, 2-in-5 US adults with arthritis were not receiving physical activity counseling in 2014.<sup>19</sup> Studies of providers show similar results. In a 2019 review, the majority of studies found that less than half of primary care providers (PCPs) and rheumatologists recommended physical activity to their patients with osteoarthritis, and less than half of patients received a recommendation<sup>20</sup>; the majority of studies in this review

were from outside of the US and reported on differences by patient, rather than provider, characteristics. To address these knowledge gaps, this study examined 2 components of physical activity counseling: assessment and recommendation. Specifically, we examined the percentage of PCPs seeing adults with arthritis, overall and by PCP characteristics, who engaged in 3 main outcomes: 1) always assess physical activity; 2) always recommend physical activity; and 3) always assess and always recommend (hereafter, “both”). We also examined multivariable-adjusted associations between PCP characteristics and the 3 main outcomes. Understanding PCPs’ physical activity assessment and recommendation behaviors for adults with arthritis can help inform the development of strategies to increase these important behaviors.

## Methods

### Design

The 2018 DocStyles survey is an online market research panel survey developed by Porter Novelli (a partner of Centers for Disease Control and Prevention [CDC]), focusing on PCPs’ attitudes, patient interactions, and resources used to stay updated on medical news and trends.<sup>21</sup> Consistent with the US Health and Human Services Code of Federal Regulations 45 CFR 46.102<sup>22</sup> and 45 CFR 46.104,<sup>23</sup> this study was exempt from CDC’s Institutional Review Board because it is public health surveillance and did not include personal identifiers, respectively. Additionally, all of the Insights Association’s professional and ethical standards and codes of conduct were followed during data collection.<sup>24</sup> Participants were informed that their answers would be used for market research, were able to refuse answering any question, and no personally identifiable information was included in the dataset shared with CDC.

### Sample

Porter Novelli distributed the survey via SERMO’s Global Medical Panel (panel of 550,000 US physicians),<sup>25</sup> which provided the primary data for our study. An additional sample was drawn from SERMO’s partner panels of US nurse practitioners: SurveyHealthcareGlobus (panel of 225,000 US nurses)<sup>26</sup> and WebMD Market Research (panel of 166,510 nurse practitioners worldwide; only US nurse practitioners surveyed).<sup>27</sup> DocStyles inclusion criteria for PCPs were: living and practicing medicine in the US, practicing medicine for 3 years, seeing 10 patients weekly, aged 21 years, and working at an individual, group, or inpatient practice.

From June 22, 2018 to August 20, 2018, SERMO invited participants (n = 2,582) by email to participate in the DocStyles survey with target quotas of 1,000 primary care physicians, 250 obstetricians/gynecologists (OB/GYNs), and 250 nurse practitioners. The sampling methodology was consistent across the 3 panels. They first invited participants who had not taken the 2017 DocStyles survey. Among them, SERMO invited those having a history of high responsiveness to surveys (completing >75%) first, followed by medium (completing 25-75%), and low responsiveness (completing <25%) until they filled quotas. If they did not fill participant quotas by deadlines, they invited those participating in the 2017 DocStyles

survey. Participants received an honorarium ranging from \$55 to \$77 based on the number of questions asked. SERMO features additional details on their website.<sup>25</sup>

Of the 2,582 panel members invited, 1,077 were not included because: the survey closed (n = 894), quota was filled (n = 98), they did not meet eligibility criteria (n = 52), or they had an incomplete survey (n = 33) (Figure 1); 1,505 PCPs completed the survey (response rate = 58.3%). We included OB/GYNs in the sample because they frequently offer primary care services<sup>28</sup> and OB/GYNs are frequently a woman's sole provider,<sup>29</sup> especially for minority groups.<sup>30</sup> The survey asked PCPs to report the average number of adults with arthritis seen weekly. We excluded PCPs who did not see adults with arthritis from the analytic dataset (n = 116), resulting in a final sample size of 1,389.

## Measures

**Physical activity counseling variables.**—The statement, “The next few questions relate to adult patients with various arthritis/rheumatic conditions such as osteoarthritis, rheumatoid arthritis, lupus, gout, and fibromyalgia.” preceded 7 multiple choice questions about arthritis, 3 of which are reported on in the current study (Figure 1). The survey then asked PCPs seeing 1 adults with arthritis weekly to report on physical activity counseling for adults with arthritis. For the main analysis, we grouped PCPs' responses into 3 non-mutually exclusive groups: “always assesses,” “always recommends,” and “both.” We conducted this analysis presuming that adults, including those with arthritis, should receive physical activity assessment and recommendation at every visit, regardless of whether they were active at a previous visit. This is supported by the American Medical Association, American College of Sports Medicine, and American Heart Association.<sup>16,17</sup> We conducted additional analyses to determine percentage of PCPs in other counseling groups (“sometimes assesses,” “never assesses,” “sometimes recommends,” and “never recommends”).

**Sociodemographic and medical practice variables.**—PCPs self-reported 4 sociodemographic (age, sex, race/ethnicity, and region of residence) and 9 medical practice characteristics (provider type, years practicing medicine, teaching hospital privileges, main work setting, average number of patients seen weekly, average number of adults with arthritis seen weekly, PCP estimated household income of the majority of patients, number of providers in practice, and patient portal availability).

## Analysis

We calculated overall distributions of PCP sociodemographic and medical practice characteristics. Next, we calculated percentage and 95% confidence intervals (CIs) for PCPs in each group (“always assesses,” “always recommends,” and “both”), overall and across PCP sociodemographic and medical practice characteristics. We also calculated percentage and 95% CIs of PCPs in other counseling groups (“sometimes assesses,” “never assesses,” “sometimes recommends,” and “never recommends”). We used pairwise *t*-tests and orthogonal linear contrasts to identify statistically significant differences and trends<sup>31</sup>; *p*-values <0.05 were considered statistically significant. We also conducted a sensitivity analysis and examined percentages for the 3 outcomes (“always assesses”, “always recommends”, and “both”) for the sample with and without OB/GYNs.

Next, we conducted binary logistic regression analyses to generate multivariable-adjusted prevalence ratios (PRs) for each of the 3 main outcomes. We examined 3 outcomes (“always assess”, “always recommends”, and “both” groups) as dichotomous (yes/no) variables (e.g., “always assess” vs. “does not always assess”). Each logistic regression model contained all sociodemographic (age, sex, race/ethnicity, and region of residence) and medical practice characteristics (provider type, years practicing medicine, privileges at a teaching hospital, main work setting, average number of patients seen per week [total and with arthritis], PCP estimated household income of majority of patients, practitioners in practice, and patient portal availability). Prevalence ratios with non-overlapping confidence intervals were interpreted as statistically significant. We used SAS version 9.4 and SUDAAN version 11.0 for all analyses.

## Results

Table 1 presents the distribution of demographic and medical practice characteristics among the analytic sample, while Figure 2 shows the percentage of PCPs reporting never, sometimes, and always assessing or recommending physical activity to adults with arthritis; 49.2% reported always assessing and 57.7% reported always recommending physical activity.

The sensitivity analysis examining estimates with and without OB/GYNs in the sample found that percentages for each outcome were similar; percentage point differences for each outcome ranged from 0.5 to 3.5 and confidence intervals for the estimates with and without OB/GYNs overlapped.

For sociodemographic characteristics, descriptive analyses showed that the percentage of PCPs reporting always doing both was greater among women compared with men ( $p < 0.01$ ). Additionally, this percentage increased with increasing PCP age ( $p < 0.01$ ) (Table 2). We found similar patterns for percentage of PCPs in the “always assesses” and “always recommends” counseling groups. However, we observed a higher, but non-significant, percentage for women compared with men in the “always assesses” group.

For medical practice characteristics, the percentage of PCPs reporting always doing both behaviors was greater among family practitioners, internists, and nurse practitioners compared with OB/GYNs ( $p < 0.01$  for each), those whose main work setting was an individual outpatient or group outpatient practice compared with an inpatient practice ( $p < 0.01$  for each), and those whose practices had a patient portal compared with those without one ( $p = 0.02$ ) (Table 2). Additionally, this percentage increased with increasing years practicing medicine, average number of total patients, and average number of adults with arthritis seen weekly ( $p < 0.01$  for all tests for trends). We observed similar patterns for the percentage of PCPs in the “always assesses” and “always recommends” groups, except for average number of total patients seen weekly.

In the multivariable-adjusted analyses, the 2 strongest associations in this analysis were for seeing an average of 20 adults with arthritis per week (referent: 1-9 adults) and each of “always assess” (PR = 1.5 [95% CI: 1.3–1.8] and “both” (PR = 1.6 [95% CI: 1.4–1.9]).

The association between seeing an average of 20 adults with arthritis per week and always recommending physical activity was modest (PR = 1.3 [95% CI: 1.2–1.5]). Having a patient portal (referent: no patient portal or not sure) was modestly associated with all 3 outcomes (“always assesses”: PR = 1.2 [95% CI: 1.1–1.4]; “always recommends”: PR = 1.3 [95% CI: 1.1–1.4]; and “both”: PR = 1.2 [95% CI: 1.1–1.5]). OB/GYNs were slightly less likely (PR = 0.8 [95% CI: 0.6–0.9] to “always recommend” compared with family practitioners and women were slightly more likely to “always assess and recommend” compared with men (PR = 1.2 [95% CI: 1.1–1.4]).

## Discussion

The current study indicates that 40% of PCPs in this study both always assess and always recommend physical activity to adults with arthritis, with differences observed by key sociodemographic and medical practice characteristics. The descriptive findings are consistent with existing literature in this field, most of which has focused on physical activity recommendation, rather than assessment. For example, in a 2019 review, the majority of studies found that approximately half or fewer providers counseled (defined in the review as advised, recommended, or prescribed) on physical activity for their patients with knee osteoarthritis.<sup>20</sup> In addition, a 2011 study found that 93% of rheumatology providers (rheumatologists, rheumatology nurses, and physical therapists) from the Netherlands reported always/regularly recommending/advising physical activity for their patients with rheumatoid arthritis.<sup>32</sup> While this study is not methodologically identical to the current study and the latter may not be generalizable to health care providers in the US, findings of these 2 studies are reasonably comparable to those of the current study, which found that 57.7% of PCPs always and 98.4% always or sometimes recommend physical activity to their patients with arthritis.

Several previous studies have examined the impact of physical activity counseling on physical activity levels among the general adult population. For example, among the general adult population, a 2012 meta-analysis of 13 randomized controlled trials in primary care settings showed modest increases in patient self-reported physical activity levels a year after receiving a recommendation from their PCP.<sup>33</sup> However, the effectiveness of physical activity counseling for adults with arthritis is less clear due to limited intervention studies, studies with equivocal results, and variations in intervention design.<sup>34–38</sup> For instance, a 2018 study found that repeated, brief counseling from a physical therapist resulted in increased physical activity levels 2 months post-intervention among adults 50 years with knee osteoarthritis.<sup>35</sup> Similarly, a 2019 study found that repeated counseling by project staff nurses resulted in decreased sedentary time 18 months post-intervention among adults with rheumatoid arthritis.<sup>36</sup> In contrast, a 2018 study found that repeated physician motivational interviewing among adults with knee osteoarthritis or rheumatoid arthritis did not result in increased physical activity levels at any timepoint up to 2 years post-intervention.<sup>38</sup> Further research is needed to clarify the role of PCP physical activity counseling for adults with arthritis, both in determining its effectiveness overall and identifying the specific components, (e.g., follow-up outside of office visits) needed to maximize its impact.

The current study observed differences in the level of physical activity assessment and recommendation by PCPs for adults with arthritis by key sociodemographic and medical practice characteristics. For example, OB/GYNs had the lowest percentage of assessment and recommendation among PCP types and were modestly associated with lower physical activity recommendation, identifying a provider type-specific gap. OB/GYNs are an important group to provide physical activity assessment and recommendation. Describing physical activity assessment and recommendation behaviors among OB/GYNs is important because 1-in-5 women consider their OB/GYN to be their PCP,<sup>39</sup> and OB/GYNs are frequently a woman's sole provider,<sup>29</sup> especially for minority groups.<sup>30</sup> Therefore, the relatively lower percentages of assessment and recommendation among OB/GYNs may disproportionately impact racial/ ethnic minority women, who represent a priority group to target counseling efforts.<sup>40</sup> OB/GYNs are also in a unique position to advise patients on the benefits of physical activity during key life phases (e.g., during the perinatal period to help women maintain a healthy weight, reduce the risk of gestational diabetes, and improve mental health<sup>41</sup>).

Regarding medical practice characteristics, the present study observed that PCPs with a patient portal in their practice reported always providing physical activity assessment and recommendation more often than those without a patient portal. Patient portal availability was associated with all 3 main outcomes. Technology supports in health systems may help integrate counseling into routine patient care. For example, clinical decision prompts can remind providers to counsel for physical activity. Some health care systems are implementing systematic assessment and documentation of physical activity levels, such as Kaiser Permanente Southern California's Exercise as a Vital Sign.<sup>42</sup> In addition, although patient portals are a relatively new technology with limited evidence on patient health outcomes,<sup>43</sup> they offer another potential technology intervention. A systematic review of controlled trials found that patient portal use by patients is associated with better treatment adherence.<sup>44</sup> Patient portals may offer a valuable method to help improve physical activity levels among people with arthritis.

Despite the importance of physical activity counseling, providers report several barriers to this practice. One barrier is a lack of physical activity educational resources for both providers and patients.<sup>20,45-47</sup> Efforts to raise awareness of existing resources may help PCPs better provide physical activity counseling. For providers, Exercise is Medicine®'s Health Care Providers' Action Guide provides tools to help providers implement physical activity counseling and locate community physical activity programs.<sup>18</sup> The Osteoarthritis Action Alliance Osteoarthritis Prevention and Management in Primary Care Toolkit provides guidance on physical activity motivational interviewing, and tools to systematically measure physical activity.<sup>48</sup> In addition, prescription pads from various organizations (e.g., Exercise is Medicine®,<sup>49</sup> ParkRx<sup>50</sup>) offer additional ways for providers to promote physical activity.<sup>51</sup> For patients, arthritis-appropriate evidence-based physical activity programs are available to adults with a wide range of physical abilities.<sup>52</sup> These programs have been shown to reduce pain,<sup>53,54</sup> fatigue,<sup>53</sup> and stiffness,<sup>53-55</sup> and improve balance<sup>53,56</sup>, strength,<sup>53-56</sup> and physical fitness<sup>53-56</sup> among people with arthritis. CDC funds state and national organizations to increase availability and awareness of these programs.

Another barrier to physical activity counseling is providers' lack of confidence and training in this area.<sup>20,45,57–62</sup> Specific to arthritis, providers report needing additional education,<sup>32</sup> not knowing appropriate physical activity types,<sup>63</sup> and addressing patient concerns about physical activity causing joint damage.<sup>64</sup> In the current study, the strongest associations across all outcomes (assessment, recommendation, and both) were observed for PCPs seeing the greatest volume of adults with arthritis weekly. Additionally, PCPs who counseled the least were younger, less experienced, and saw relatively fewer adults with arthritis weekly, which appears consistent with reported barriers of lacking confidence and training. The relatively lower percentage of physical activity assessment and recommendation in these PCPs may reflect their underlying assumption that not all adults require counseling (e.g., adults previously assessed as active, adults with severe types of arthritis). Counseling may be increased by integrating physical activity counseling training into continuing medical education, with a focus on building knowledge about physical activity and increasing clinician self-efficacy.<sup>65</sup> This education is especially important for younger providers who may lack experience with behavioral counseling.

Finally, the most common barrier to physical activity counseling reported by providers is time constraints.<sup>20,45,57–59,61,66–69</sup> Sharing education and counseling responsibilities across providers may ease time constraints for all providers. For example, allied health professionals and community health workers could partner with physicians to introduce and bolster messaging on physical activity benefits. One review showed that physical activity counseling by allied health professionals alone or as an adjunct to physician counseling generated the greatest short- and longer-term increases in patient physical activity levels compared with physician-only counseling.<sup>70</sup>

This study has at least 5 limitations. First, we obtained data from a convenience sample where the sampling quota prioritized those who had not taken the previous year's survey and highly responsive panelists, potentially introducing selection bias, although in which direction is unknown. Second, these estimates may not be representative of all US PCPs; however, the sample's distribution of age, years practicing medicine, and region of residence for physician PCPs are similar to the American Medical Association's national data for physicians (exact alignment is not reported because data are licensed by SERMO and are confidential/proprietary). Third, beliefs about physical activity counseling were not measured, so we cannot ascertain whether patient characteristics (e.g., arthritis type, previous activity level) may influence PCP physical activity assessment or recommendation. Fourth, the cross-sectional study design prevented assessment of causality. Finally, this study is based on self-reported data and may be susceptible to recall and social desirability bias.<sup>71</sup> Strengths of the study include a large sample size, diversity in PCP types, comparisons across a wide range of PCP characteristics, and examination of counseling from the provider perspective in contrast to most studies in the US, which have used patient-reported data.

In conclusion, approximately 40% of PCPs in this study always assess and recommend physical activity to adults with arthritis, with differences seen by key PCP sociodemographic and medical practice characteristics. These findings provide information on characteristics of PCPs who may need support in increasing counseling and highlight opportunities to help them engage more people with arthritis in important discussions about physical



activity. PCPs are well-positioned to educate adults with arthritis on the benefits of physical activity, given that arthritis is frequently managed in primary care rather than rheumatology.<sup>72</sup> Evidence-based approaches to increasing physical activity counseling effectiveness include enhancing provider education,<sup>65,73</sup> raising awareness of resources for patients and providers,<sup>20,45–47</sup> and providing health system supports.<sup>44</sup> Promoting a physically active lifestyle for adults with arthritis may help them achieve better clinical outcomes and improve their overall well-being and quality-of-life.<sup>4,6,7,74</sup>

## Acknowledgements

The authors thank Dr. Jennifer Hootman for her contribution to conceptualizing this study and Mr. Michael Boring for his contribution to data analysis. The contents are those of the authors and do not necessarily represent the official views of, nor an endorsement, by the Centers for Disease Control and Prevention/Health and Human Services, or the U.S. Government.

## Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Ms. Guglielmo's contributions were supported by an appointment to the Research Participation Program at the Division of Population Health, Arthritis Program, administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and Centers for Disease Control and Prevention.

## References

1. Barbour KE, Helmick CG, Boring M, Brady TJ. Vital Signs: prevalence of doctor-diagnosed arthritis and arthritis-attributable activity limitation—United States, 2013–2015. *MMWR Morb Mortal Wkly Rep*. 2017;66(9):246–253. doi:10.15585/mmwr.mm6609e1
2. Theis KA, Steinweg A, Helmick CG, Courtney-Long E, Bolen JA, Lee R. Which one? What kind? How many? Types, causes, and prevalence of disability among U.S. adults. *Disabil Health J*. 2019;12(3):411–421. doi:10.1016/j.dhjo.2019.03.001 [PubMed: 31000498]
3. Murphy LB, Cisternas MG, Pasta DJ, Helmick CG, Yelin EH. Medical expenditures and earnings losses among US adults with arthritis in 2013. *Arthritis Care Res (Hoboken)*. 2018;70(6):869–876. doi:10.1002/acr.23425 [PubMed: 28950426]
4. Kelley GA, Kelley KS, Hootman JM, Jones DL. Effects of community-deliverable exercise on pain and physical function in adults with arthritis and other rheumatic diseases: a meta-analysis. *Arthritis Care Res (Hoboken)*. 2011;63(1):79–93. doi:10.1002/acr.20347 [PubMed: 20824798]
5. Feinglass J, Thompson JA, He XZ, Witt W, Chang RW, Baker DW. Effect of physical activity on functional status among older middle-age adults with arthritis. *Arthritis Rheum*. 2005;53(6):879–885. doi:10.1002/art.21579 [PubMed: 16342096]
6. Kelley GA, Kelley KS, Hootman JM. Effects of exercise on depression in adults with arthritis: a systematic review with meta-analysis of randomized controlled trials. *Arthritis Res Ther*. 2015;17:21. doi:10.1186/s13075-015-0533-5 [PubMed: 25645739]
7. Kelley GA, Kelley KS, Callahan LF. Community-deliverable exercise and anxiety in adults with arthritis and other rheumatic diseases: a systematic review with meta-analysis of randomised controlled trials. *BMJ Open*. 2018;8(2):e019138. doi:10.1136/bmjopen-2017-019138
8. US Dept of Health and Human Services. 2018 Physical Activity Guidelines for Americans. US Dept of Health and Human Services; 2018. Accessed December 6, 2019. [https://health.gov/paguidelines/second-edition/pdf/Physical\\_Activity\\_Guidelines\\_2nd\\_edition.pdf](https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf)
9. Kolasinski SL, Neogi T, Hochberg MC, et al. 2019 American College of Rheumatology/Arthritis Foundation guidelines for the management of osteoarthritis of the hand, hip, and knee. *Arthritis Rheumatol*. 2020;72(2):220–233. doi:10.1002/art.41142 [PubMed: 31908163]
10. Murphy LB, Hootman JM, Boring MA, et al. Leisure time physical activity among U.S. adults with arthritis, 2008–2015. *Am J Prev Med*. 2017;53(3):345–354. doi:10.1016/j.amepre.2017.03.017 [PubMed: 28601405]

11. Wilcox S, Der Ananian C, Abbott J, et al. Perceived exercise barriers, enablers, and benefits among exercising and nonexercising adults with arthritis: results from a qualitative study. *Arthritis Rheum.* 2006;55(4):616–627. doi:10.1002/art.22098 [PubMed: 16874785]
12. Der Ananian C, Wilcox S, Saunders R, Watkins K, Evans A. Factors that influence exercise among adults with arthritis in three activity levels. *Prev Chronic Dis.* 2006;3(3):A81. [PubMed: 16776882]
13. Stone RC, Baker J. Painful choices: a qualitative exploration of facilitators and barriers to active lifestyles among adults with osteoarthritis. *J Appl Gerontol.* 2017;36(9):1091–1116. doi:10.1177/0733464815602114 [PubMed: 26316267]
14. Iversen MD, Scanlon L, Frits M, Shadick NA, Sharby N. Perceptions of physical activity engagement among adults with rheumatoid arthritis and rheumatologists. *Int J Clin Rheumatol.* 2015;10(2):67–77. [PubMed: 26075028]
15. O'Halloran PD, Blackstock F, Shields N, et al. Motivational interviewing to increase physical activity in people with chronic health conditions: a systematic review and meta-analysis. *Clin Rehabil.* 2014;28(12):1159–1171. doi:10.1177/0269215514536210 [PubMed: 24942478]
16. Lobelo F, Stoutenberg M, Hutber A. The Exercise is Medicine Global Health Initiative: a 2014 update. *Br J Sports Med.* 2014;48(22):1627–1633. doi:10.1136/bjsports-2013-093080 [PubMed: 24759911]
17. Lobelo F, Rohm Young D, Sallis R, et al. Routine assessment and promotion of physical activity in healthcare settings: a scientific statement from the American Heart Association. *Circulation.* 2018;137(18):e495–e522. doi:10.1161/CIR.0000000000000559 [PubMed: 29618598]
18. American College of Sports Medicine (ACSM). Exercise is Medicine. Healthcare Providers' Action Guide. Updated 2020. Accessed December 6, 2019. [https://www.exercisemedicine.org/assets/page\\_documents/EIM%20Health%20Care%20Providers%20Action%20Guide%20clickable%20links.pdf](https://www.exercisemedicine.org/assets/page_documents/EIM%20Health%20Care%20Providers%20Action%20Guide%20clickable%20links.pdf)
19. Hootman JM, Murphy LB, Omura JD, et al. Health care provider counseling for physical activity or exercise among adults with arthritis—United States, 2002 and 2014. *MMWR Morb Mortal Wkly Rep.* 2018;66(5152):1398–1401. doi:10.15585/mmwr.mm665152a2 [PubMed: 29300722]
20. Waugh E, King L, Gakhal N, Hawker G, Webster F, White D. Physical activity intervention in primary care and rheumatology for the management of knee osteoarthritis: a review. *Arthritis Care Res (Hoboken).* 2019;71(2):189–197. doi:10.1002/acr.23622 [PubMed: 29920972]
21. Porter Novelli. DocStyles. PN Styles. Accessed August 20, 2020. <https://styles.porternovelli.com/docstyles/>
22. 45 CFR sec 46.102 (2018).
23. 45 CFR sec 46.104 (2018).
24. Insights Association. IA Code of Standards and Ethics for Marketing Research and Data Analytics. Insights Association. Published 2020. Accessed August 20, 2020. <https://www.insightsassociation.org/issues-policies/insights-association-code-standards-and-ethics-market-research-and-data-analytics-0>
25. Sermo Business. ESOMAR 28 Questions. Updated 2019. Accessed December 6, 2019. <https://www.sermo.com/business/esomar-28/>
26. SurveyHealthcareGlobus. Panel Counts. SurveyHealthcareGlobus. Published 2020. Accessed August 20, 2020. <https://www.surveyhealthcareglobus.com/our-panel/united-states/>
27. WebMD Medscape. Market Research. WebMD Medscape. Published 2020. Accessed August 20, 2020. <https://www.medscape.com/sites/public/marketresearch>
28. Leader S, Perales PJ. Provision of primary-preventive health care services by obstetrician-gynecologists. *Obstet Gynecol.* 1995;85(3):391–395. doi:10.1016/0029-7844(94)00411-6 [PubMed: 7862378]
29. Lewis BG, Halm EA, Marcus SM, Korenstein D, Federman AD. Preventive services use among women seen by gynecologists, general medical physicians, or both. *Obstet Gynecol.* 2008;111(4):945–952. doi:10.1097/AOG.0b013e318169ce3e [PubMed: 18378755]
30. Rosser ML, Brusati AJ. An opportunity for obstetrician-gynecologists to affect the epidemic of cardiovascular disease in women. *Obstet Gynecol.* 2014;123:187 S. doi:10.1097/01.AOG.0000447211.60453.31

31. Research Triangle Institute. SUDAAN Language Manual. 11th ed. Research Triangle Institute; 2012.
32. Hurkmans EJ, de Gucht V, Maes S, Peeters AJ, Ronday HK, Vliet Vlieland TP. Promoting physical activity in patients with rheumatoid arthritis: rheumatologists' and health professionals' practice and educational needs. *Clin Rheumatol*. 2011;30(12):1603–1609. doi:10.1007/s10067-011-1846-7 [PubMed: 21912880]
33. Orrow G, Kinmonth A-L, Sanderson S, Sutton S. Effectiveness of physical activity promotion based in primary care: systematic review and meta-analysis of randomised controlled trials. *BMJ*. 2012;344: e1389. doi:10.1136/bmj.e1389 [PubMed: 22451477]
34. Thomsen T, Esbensen BA, Hetland ML, Aadahl M. Motivational counseling and text message reminders: for reduction of daily sitting time and promotion of everyday physical activity in people with rheumatoid arthritis. *Rheum Dis Clin North Am*. 2019;45(2):231–244. doi:10.1016/j.rdc.2019.01.005 [PubMed: 30952395]
35. Li LC, Sayre EC, Xie H, et al. Efficacy of a community-based technology-enabled physical activity counseling program for people with knee osteoarthritis: proof-of-concept study. *J Med Internet Res*. 2018;20(4):e159. doi:10.2196/jmir.8514 [PubMed: 29712630]
36. Tanja T, Aadahl M, Beyer N, et al. Sustained long-term efficacy of motivational counselling and text message reminders on daily sitting time in patients with rheumatoid arthritis? Long-term follow-up of a randomized, parallel-group trial. *Arthritis Care Res (Hoboken)*. 2020;72(11):1560–1570. doi:10.1002/acr.24060 [PubMed: 31507095]
37. Knittle K, De Gucht V, Hurkmans E, et al. Targeting motivation and self-regulation to increase physical activity among patients with rheumatoid arthritis: a randomised controlled trial. *Clin Rheumatol*. 2015;34(2):231–238. doi:10.1007/s10067-013-2425-x [PubMed: 24213780]
38. Gilbert AL, Lee J, Ehrlich-Jones L, et al. A randomized trial of a motivational interviewing intervention to increase lifestyle physical activity and improve self-reported function in adults with arthritis. *Semin Arthritis Rheum*. 2018;47(5):732–740. doi:10.1016/j.semarthrit.2017.10.003 [PubMed: 29096934]
39. Mazzoni S, Brewer S, Durfee J, et al. Patient perspectives of obstetrician-gynecologists as primary care providers. *J Reprod Med*. 2017;62(1–2):3–8. [PubMed: 29999273]
40. American College of Physicians. Racial and ethnic disparities in health care. Updated 2010. A Position Paper of the American College of Physicians. American College of Physicians; 2010. Policy Paper. Published 2010. Accessed August 20, 2020. [https://www.acponline.org/acp\\_policy/policies/racial\\_ethnic\\_disparities\\_2010.pdf](https://www.acponline.org/acp_policy/policies/racial_ethnic_disparities_2010.pdf)
41. ACOG Committee opinion no. 650: physical activity and exercise during pregnancy and the postpartum period. *Obstet Gynecol*. 2015;126(6):e135–142. doi:10.1097/AOG.0000000000001214 [PubMed: 26595585]
42. Sallis R Developing healthcare systems to support exercise: exercise as the fifth vital sign. *Br J Sports Med*. 2011;45(6):473–474. doi:10.1136/bjsm.2010.083469 [PubMed: 21292925]
43. Goldzweig CL, Orshansky G, Paige NM, et al. Electronic patient portals: evidence on health outcomes, satisfaction, efficiency, and attitudes: a systematic review. *Ann Intern Med*. 2013;159(10):677–687. doi:10.7326/0003-4819-159-10-201311190-00006 [PubMed: 24247673]
44. Ammenwerth E, Schnell-Inderst P, Hoerbst A. The impact of electronic patient portals on patient care: a systematic review of controlled trials. *J Med Internet Res*. 2012;14(6):e162. doi:10.2196/jmir.2238 [PubMed: 23183044]
45. Pinto BM, Goldstein MG, Marcus BH. Activity counseling by primary care physicians. *Prev Med*. 1998;27(4):506–513. doi:10.1006/pmed.1998.0335 [PubMed: 9672943]
46. Bélanger M, Couturier E, Dion N, Girouard V, Phillips J, Brunet J. Family physicians' perceptions toward writing physical activity prescriptions: I tell patients it's like the super pill!. *Qual Prim Care*. 2015;23:113–121.
47. O'Brien MW, Shields CA, Oh PI, Fowles JR. Health care provider confidence and exercise prescription practices of Exercise is Medicine Canada Workshop attendees. *Appl Physiol Nutr Metab*. 2017;42(4):384–390. doi:10.1139/apnm-2016-0413 [PubMed: 28177736]
48. Osteoarthritis Action Alliance. Osteoarthritis prevention & management in primary care. Published 2019. Accessed December 6, 2019. <https://oaaction.unc.edu/resource-library/modules/>

49. American College of Sports Medicine. Exercise is medicine. Exercise prescription form. Published 2019. Accessed December 6, 2019. [https://www.exerciseismedicine.org/assets/page\\_documents/EIM%20Prescription%202018%20pad%202-up.pdf](https://www.exerciseismedicine.org/assets/page_documents/EIM%20Prescription%202018%20pad%202-up.pdf)
50. The Institute at Golden Gate. ParkRx. Park Prescription Program Toolkit. Published 2019. Accessed December 6, 2019. <https://www.parkrx.org/parkrx-toolkit>
51. Swinburn BA, Walter LG, Arroll B, Tilyard MW, Russell DG. The green prescription study: a randomized controlled trial of written exercise advice provided by general practitioners. *Am J Public Health*. 1998;88(2):288–291. doi:10.2105%2Fajph.88.2.288 [PubMed: 9491025]
52. Centers for Disease Control and Prevention. Arthritis. Physical Activity Programs. Updated October 18, 2019. Accessed December 6, 2019. [www.cdc.gov/arthritis/interventions/physical-activity.html](http://www.cdc.gov/arthritis/interventions/physical-activity.html)
53. Callahan LF, Shreffler JH, Altpeter M, et al. Evaluation of group and self-directed formats of the Arthritis Foundation's Walk With Ease Program. *Arthritis Care Res (Hoboken)*. 2011;63(8):1098–1107. doi:10.1002/acr.20490 [PubMed: 21560255]
54. Seymour RB, Hughes SL, Campbell RT, Huber GM, Desai P. Comparison of two methods of conducting the Fit and Strong! program. *Arthritis Rheum*. 2009;61(7):876–884. doi:10.1002/art.24517 [PubMed: 19565560]
55. Callahan LF, Cleveland RJ, Shreffler J, et al. Evaluation of active living every day in adults with arthritis. *J Phys Act Health*. 2014;11(2):285–296. doi:10.1123/jpah.2011-0307 [PubMed: 23359072]
56. Belza B, Shumway-Cook A, Phelan EA, Williams B, Snyder SJ, LoGerfo JP. The effects of a community-based exercise program on function and health in older adults: the EnhanceFitness program. *J Appl Gerontol*. 2006;25(4):291–306. doi:10.1177/0733464806290934
57. Walsh JME, Swangard DM, Davis T, McPhee SJ. Exercise counseling by primary care physicians in the era of managed care. *Am J Prev Med*. 1999;16(4):307–313. doi:10.1016/s0749-3797(99)00021-5 [PubMed: 10493287]
58. Hébert ET, Caughy MO, Shuval K. Primary care providers' perceptions of physical activity counselling in a clinical setting: a systematic review. *Br J Sports Med*. 2012;46(9):625–631. doi:10.1136/bjsports-2011-090734 [PubMed: 22711796]
59. Lobelo F, Duperly J, Frank E. Physical activity habits of doctors and medical students influence their counselling practices. *Br J Sports Med*. 2009;43(2):89–92. doi:10.1136/bjsem.2008.055426 [PubMed: 19019898]
60. Williford HN, Barfield BR, Lazenby RB, Olson MS. A survey of physicians' attitudes and practices related to exercise promotion. *Prev Med*. 1992;21(5):630–636. doi:10.1016/0091-7435(92)90070-x [PubMed: 1438111]
61. Long BJ, Calfas KJ, Wooten W, et al. A multisite field test of the acceptability of physical activity counseling in primary care: project PACE. *Am J Prev Med*. 1996;12(2):73–81. [PubMed: 8777071]
62. Christiansen MB, White DK, Christian J, et al. "It...doesn't always make it [to] the top of the list." Primary care physicians' experiences with prescribing exercise for knee osteoarthritis. *Can Fam Physician*. 2020;66(1):e14–e20.
63. Lillie K, Ryan S, Adams J. The educational needs of nurses and allied healthcare professionals caring for people with arthritis: results from a cross-sectional survey. *Musculoskeletal Care*. 2013;11(2):93–98. doi:10.1002/msc.1035 [PubMed: 23065861]
64. Halls S, Law RJ, Jones JG, Markland DA, Maddison PJ, Thom JM. Health professionals' perceptions of the effects of exercise on joint health in rheumatoid arthritis patients. *Musculoskeletal Care*. 2017;15(3):196–209. doi:10.1002/msc.1157 [PubMed: 27709770]
65. Wattanapisit A, Tuangratananon T, Thanamee S. Physical activity counseling in primary care and family medicine residency training: a systematic review. *BMC Med Educ*. 2018;18(1):159. doi:10.1186/s12909-018-1268-1 [PubMed: 29970092]
66. Abramson S, Stein J, Schaufele M, Frates E, Rogan S. Personal exercise habits and counseling practices of primary care physicians: a national survey. *Clin J Sport Med*. 2000;10(1):40–48. doi:10.1097/00042752-200001000-00008 [PubMed: 10695849]

67. Yarnall KSH, Pollak KI, Østbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health*. 2003;93(4):635–641. doi:10.2105/ajph.93.4.635 [PubMed: 12660210]
68. Petrella RJ, Wight D. An office-based instrument for exercise counseling and prescription in primary care. The Step Test Exercise Prescription (STEP). *Arch Fam Med*. 2000;9(4):339–344. doi:10.1001/archfami.9.4.339 [PubMed: 10776362]
69. Omura JD, Bellissimo MP, Watson KB, Loustalot F, Fulton JE, Carlson SA. Primary care providers' physical activity counseling and referral practices and barriers for cardiovascular disease prevention. *Prev Med*. 2018;108:115–122. doi:10.1016/j.ypmed.2017.12.030 [PubMed: 29288783]
70. Tulloch H, Fortier M, Hogg W. Physical activity counseling in primary care: who has and who should be counseling? *Patient Educ Counsg*. 2006;64(1):6–20. doi:10.1016/j.pec.2005.10.010
71. Adams AS, Soumerai SB, Lomas J, Ross-Degnan D. Evidence of self-report bias in assessing adherence to guidelines. *Int J Qual Health Care*. 1999;11(3):187–192. [PubMed: 10435838]
72. Cisternas MG, Yelin E, Katz JN, Solomon DH, Wright EA, Losina E. Ambulatory visit utilization in a national, population-based sample of adults with osteoarthritis. *Arthritis Rheum*. 2009;61(12):1694–1703. doi:10.1002/art.24897 [PubMed: 19950315]
73. Jacobson DM, Strohecker L, Compton MT, Katz DL. Physical activity counseling in the adult primary care setting: position statement of the American College of Preventive Medicine. *Am J Prev Med*. 2005;29(2):158–162. doi:10.1016/j.amepre.2005.04.009
74. Rausch Osthoff A- K, Niedermann K, Braun J, et al. 2018 EULAR recommendations for physical activity in people with inflammatory arthritis and osteoarthritis. *Ann Rheum Dis*. 2018;77(9):1251–1260. doi:10.1136/annrheumdis-2018-213585 [PubMed: 29997112]

### So What?

#### What is already known on this topic?

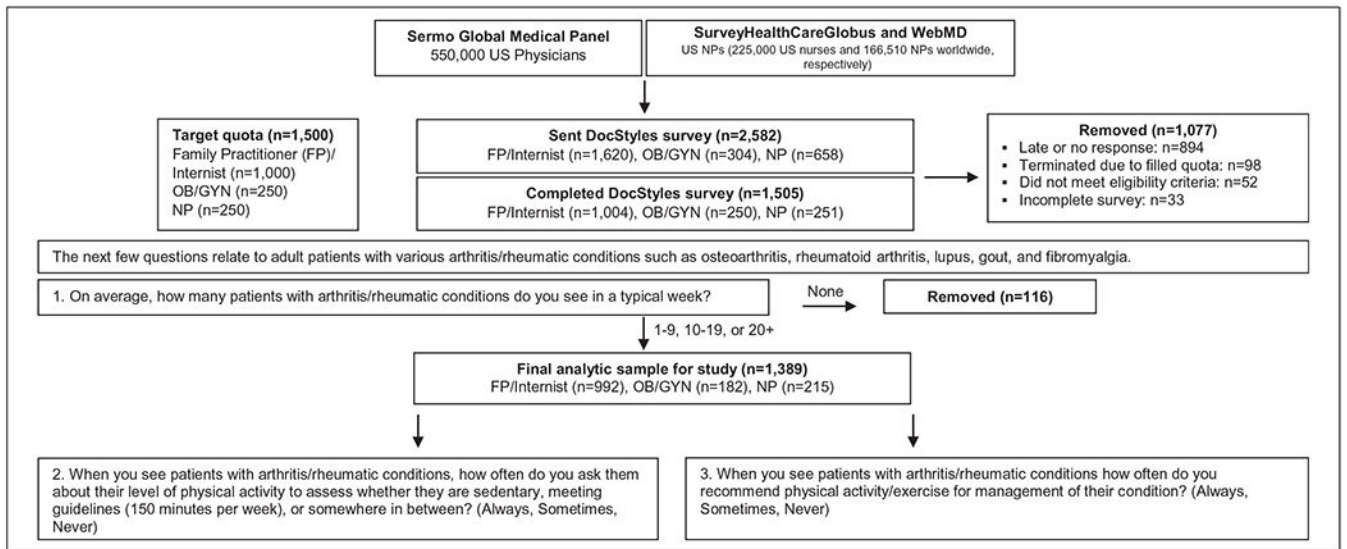
Despite physical activity's numerous benefits for adults with arthritis including pain relief, only 42% of adults with arthritis are aerobically active. PCPs play an integral role in activating adults' physical activity behavior change.

#### What does this article add?

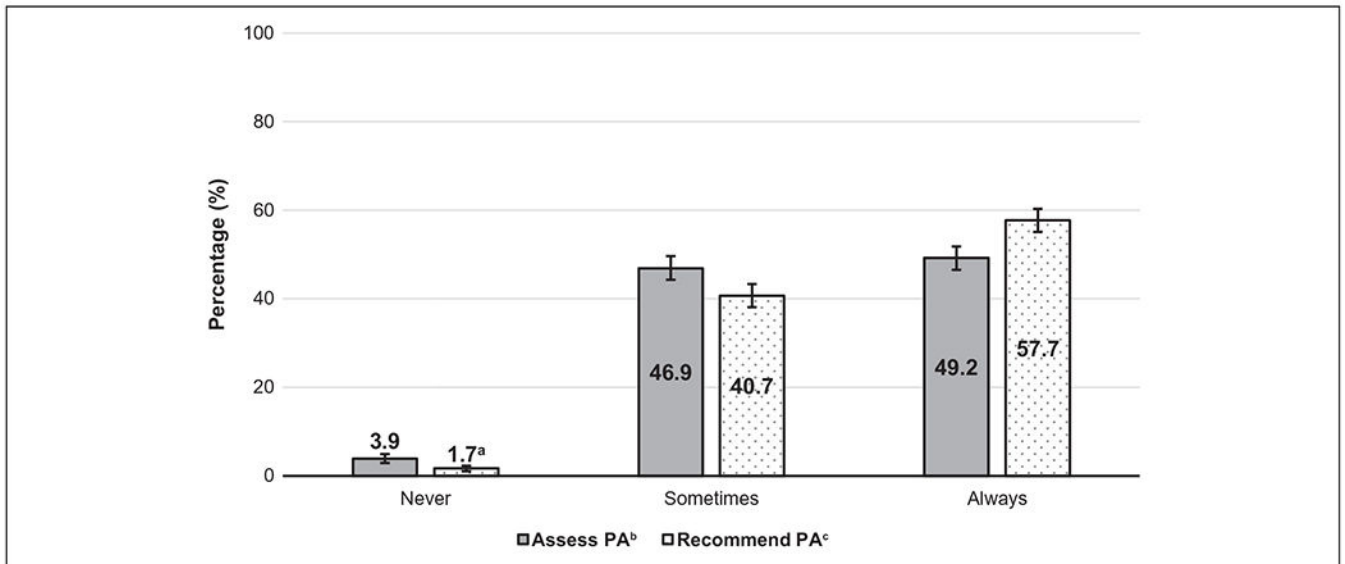
Only 2-in-5 PCPs consistently assess and recommend physical activity to adults with arthritis. These behaviors were most strongly associated with seeing 20 adults with arthritis weekly; modest associations were observed for having a patient portal.

#### What are the implications for health promotion practice or research?

Ideally, increasing PCP counseling for physical activity is a multifaceted strategy that includes providing counseling training to improve PCP self-efficacy, promoting existing evidence-based counseling guidance for PCPs, and incorporating technology supports such as clinical decision prompts to facilitate systematic and routine counseling.



**Figure 1.** Flowchart of sample selection process and arthritis question sequence, DocStyles 2018. FP: family practitioner; OB/GYN: obstetrician/gynecologist; NP: nurse practitioner.



**Figure 2.**

Percentage reporting physical activity assessment and recommendation among primary care providers (n = 1,389) seeing adults with arthritis, DocStyles 2018.

PA: physical activity. <sup>a</sup>Based on a relative standard error of 20.7%, the estimate of 1.7% is considered unstable and should be interpreted with caution <sup>b</sup>Defined using the question, “When you see patients with arthritis/rheumatic conditions, how often do you ask them about their level of physical activity to assess whether they are sedentary, meeting guidelines (150 minutes per week), or somewhere in between?” <sup>c</sup>Defined using the question, “When you see patients with arthritis/rheumatic conditions how often do you recommend physical activity/exercise for management of their condition?”



**Table 1.**

Distribution of Characteristics Among Primary Care Providers (n = 1,389) Seeing Adults With Arthritis, DocStyles 2018.

PCP characteristics	n	% <sup>a</sup> (95% CI)
<b>Sociodemographic characteristics</b>		
<b>Age (years)</b>		
21-39	293	21.1 (18.9–23.2)
40-49	458	33.0 (30.5–35.4)
50	638	45.9 (43.3–48.6)
<b>Sex</b>		
Men	798	57.5 (54.8–60.1)
Women	591	42.5 (39.9–45.2)
<b>Race/Ethnicity</b>		
Non-Hispanic White	932	67.1 (64.6–69.6)
Non-Hispanic Asian	262	18.9 (16.8–20.9)
Other Race/Ethnicity	195	14.0 (12.2–15.9)
<b>Region of residence</b>		
Northeast	327	23.5 (21.3–25.8)
Midwest	321	23.1 (20.9–25.3)
South	483	34.8 (32.3–37.3)
West	258	18.6 (16.5–20.6)
<b>Medical practice-related characteristics</b>		
<b>Provider type</b>		
Family practitioner	479	34.5 (32.0–37.0)
Internist	513	36.9 (34.4–39.5)
Obstetrician/Gynecologist	182	13.1 (11.3–14.9)
Nurse practitioner	215	15.5 (13.6–17.4)
<b>Years practicing medicine</b>		
<10	296	21.3 (19.2–23.5)
10-19	502	36.1 (33.6–38.7)
20-29	397	28.6 (26.2–31.0)
30	194	14.0 (12.1–15.8)
<b>Privileges at a teaching hospital</b>		
Yes	635	45.7 (43.1–48.3)
No	754	54.3 (51.7–56.9)
<b>Main work setting</b>		
Individual outpatient practice	305	22.0 (19.8–24.1)
Group outpatient practice	933	67.2 (64.7–69.6)
Inpatient practice	151	10.9 (9.2–12.5)
<b>Average number of total patients seen per week</b>		
<75	283	20.4 (18.3–22.5)
75-99	284	20.4 (18.3–22.6)

PCP characteristics	n	% <sup>a</sup> (95% CI)
100-124	443	31.9 (29.4–34.3)
125	379	27.3 (24.9–29.6)
<b>Average number of adults with arthritis seen per week</b>		
1-9	610	43.9 (41.3–46.5)
10-19	458	33.0 (30.5–35.4)
20	321	23.1 (20.9–25.3)
<b>Estimated household income of majority of patients<sup>b</sup></b>		
<\$50,000	419	30.2 (27.7–32.6)
\$50,000-\$99,999	522	37.6 (35.0–40.1)
\$100,000	448	32.3 (29.8–34.7)
<b>Practitioners in practice<sup>c</sup></b>		
1-2	308	22.2 (20.0–24.4)
3-5	388	27.9 (25.6–30.3)
6-11	308	22.2 (20.0–24.4)
12	385	27.7 (25.4–30.1)
<b>Patient portal available</b>		
Yes	1004	72.3 (69.9–74.6)
No/Not sure	385	27.7 (25.4–30.1)

CI: confidence interval

<sup>a</sup>Some columns do not sum to 100% because of rounding.

<sup>b</sup>Defined using the question: "Please select the category that best describes the approximate financial situation (household income) of the majority of your patients."

<sup>c</sup>Number of practitioners in the practice includes respondents.

**Table 2.**

Percentages and Multivariable-Adjusted Prevalence Ratios<sup>a</sup> of Physical Activity Assessment and Recommendation by Primary Care Providers (n = 1,389) for Adults With Arthritis, Across Sociodemographic and Medical Practice Characteristics, DocStyles 2018.

PCP characteristics	Study n (denominator)	Always assesses PA			Always recommends PA			Both (always assesses and always recommends PA)		
		% (95% CI)	PR <sup>b</sup> (95% CI)	PR <sup>b</sup> (95% CI)	% (95% CI)	PR <sup>b</sup> (95% CI)	PR <sup>b</sup> (95% CI)	% (95% CI)	PR <sup>b</sup> (95% CI)	
Overall	1,389	49.2 (46.5–51.8)			57.7 (55.1–60.3)			39.7 (37.2–42.3)		
<i>Sociodemographic characteristics</i>										
<b>Age (years)</b>										
21–39	293	39.2 (33.7–44.8)	Ref		53.6 (47.9–59.3)	Ref		32.8 (27.4–38.1)	Ref	
40–49	458	43.2 (38.7–47.8)	1.1 (0.9–1.3)		53.7 (49.1–58.3)	1.0 (0.9–1.2)		33.6 (29.3–38.0)	1.0 (0.8–1.2)	
50	638	58.0 (54.2–61.8)	1.3 (1.0–1.7)		62.4 (58.6–66.1)	1.1 (0.9–1.3)		47.3 (43.5–51.2)	1.3 (1.0–1.7)	
<b>Sex</b>										
Men	798	47.0 (43.5–50.5)	Ref		54.9 (51.4–58.3)	Ref		36.7 (33.4–40.1)	Ref	
Women	591	52.1 (48.1–56.1)	1.1 (1.0–1.2)		61.4 (57.5–65.4)	1.1 (1.0–1.2)		43.8 (39.8–47.8)	<b>1.2 (1.1–1.4)</b>	
<b>Race/Ethnicity</b>										
Non-Hispanic White	932	48.7 (45.5–51.9)	Ref		56.8 (53.6–59.9)	Ref		38.8 (35.7–42.0)	Ref	
Non-Hispanic Asian	262	47.7 (41.7–53.8)	1.1 (0.9–1.2)		60.3 (54.4–66.2)	1.1 (1.0–1.2)		41.6 (35.6–47.6)	1.2 (1.0–1.4)	
Other Race/Ethnicity	195	53.3 (46.3–60.3)	1.2 (1.0–1.4)		58.5 (51.5–65.4)	1.1 (0.9–1.2)		41.5 (34.6–48.5)	1.1 (0.9–1.4)	
<b>Region of residence</b>										
Northeast	327	50.2 (44.7–55.6)	Ref		58.1 (52.7–63.5)	Ref		40.7 (35.3–46.0)	Ref	
Midwest	321	55.8 (50.3–61.2)	1.1 (0.9–1.3)		61.1 (55.7–66.4)	1.0 (0.9–1.1)		44.5 (39.1–50.0)	1.1 (0.9–1.3)	
South	483	43.7 (39.3–48.1)	0.9 (0.8–1.0)		54.5 (50.0–58.9)	0.9 (0.8–1.1)		35.8 (31.5–40.1)	0.9 (0.7–1.1)	
West	258	50.0 (43.9–56.1)	1.0 (0.9–1.2)		58.9 (52.9–64.9)	1.0 (0.9–1.1)		39.9 (33.9–45.9)	1.0 (0.8–1.2)	
<i>Medical practice characteristics</i>										
<b>Provider type</b>										
Family practitioner	479	49.9 (45.4–54.4)	Ref		61.8 (57.4–66.2)	Ref		41.5 (37.1–46.0)	Ref	
Internist	513	49.5 (45.2–53.8)	1.0 (0.9–1.2)		58.5 (54.2–62.7)	1.0 (0.9–1.1)		39.6 (35.3–43.8)	1.0 (0.8–1.2)	
Obstetrician/Gynecologist	182	36.8 (29.8–43.8)	0.8 (0.7–1.0)		40.7 (33.5–47.8)	<b>0.8 (0.6–0.9)</b>		26.9 (20.5–33.4)	0.8 (0.6–1.0)	
Nurse practitioner	215	57.2 (50.6–63.8)	1.2 (1.0–1.4)		60.9 (54.4–67.5)	1.0 (0.8–1.1)		47.0 (40.3–53.7)	1.2 (1.0–1.5)	
<b>Years practicing medicine</b>										
<10	296	40.9 (35.3–46.5)	Ref		53.7 (48.0–59.4)	Ref		32.4 (27.1–37.8)	Ref	

PCP characteristics	Study n (denominator)	Always assesses PA			Always recommends PA			Both (always assesses and always recommends PA)		
		% (95% CI)	PR <sup>a</sup> (95% CI)	% (95% CI)	% (95% CI)	PR <sup>b</sup> (95% CI)	% (95% CI)	PR <sup>b</sup> (95% CI)		
10-19	502	43.8 (39.5–48.2)	1.0 (0.8–1.2)	54.6 (50.2–58.9)	1.0 (0.9–1.2)	36.1 (31.9–40.3)	1.0 (0.8–1.3)			
20-29	397	55.2 (50.3–60.1)	1.1 (0.9–1.4)	59.9 (55.1–64.8)	1.1 (0.9–1.3)	44.3 (39.4–49.2)	1.1 (0.8–1.5)			
30	194	63.4 (56.6–70.2)	1.2 (1.0–1.6)	67.0 (60.4–73.6)	1.2 (1.0–1.5)	51.0 (44.0–58.1)	1.3 (0.9–1.7)			
<b>Privileges at a teaching hospital</b>										
Yes	635	50.7 (46.8–54.6)	1.1 (1.0–1.2)	56.5 (52.7–60.4)	1.0 (0.9–1.1)	39.8 (36.0–43.7)	1.0 (0.9–1.2)			
No	754	47.9 (44.3–51.4)	Ref	58.6 (55.1–62.1)	Ref	39.7 (36.2–43.2)	Ref			
<b>Main work setting</b>										
Individual outpatient practice	305	56.1 (50.5–61.6)	Ref	59.0 (53.5–64.5)	Ref	44.3 (38.7–49.8)	Ref			
Group outpatient practice	933	48.7 (45.4–51.9)	0.9 (0.8–1.0)	58.6 (55.5–61.8)	1.0 (0.8–1.1)	40.0 (36.8–43.1)	0.9 (0.7–1.1)			
Inpatient practice	151	38.4 (30.6–46.2)	0.8 (0.6–1.0)	49.0 (41.0–57.0)	0.9 (0.7–1.1)	29.1 (21.9–36.4)	0.8 (0.6–1.0)			
<b>Average number of all patients seen per week</b>										
<75	283	47.0 (41.2–52.8)	Ref	58.0 (52.2–63.7)	Ref	35.3 (29.8–40.9)	Ref			
75–99	284	48.2 (42.4–54.1)	0.9 (0.8–1.1)	58.8 (53.1–64.5)	1.0 (0.8–1.1)	36.6 (31.0–42.2)	1.0 (0.8–1.2)			
100-124	443	46.0 (41.4–50.7)	0.9 (0.8–1.1)	56.2 (51.6–60.8)	0.9 (0.8–1.1)	38.8 (34.3–43.4)	1.1 (0.9–1.3)			
125	379	55.1 (50.1–60.2)	1.1 (0.9–1.3)	58.3 (53.3–63.3)	1.0 (0.8–1.1)	46.4 (41.4–51.5)	1.2 (1.0–1.5)			
<b>Average number of adults with arthritis seen per week</b>										
1–9	610	39.5 (35.6–43.4)	Ref	49.3 (45.4–53.3)	Ref	30.2 (26.5–33.8)	Ref			
10-19	458	49.8 (45.2–54.4)	1.2 (1.0–1.3)	59.2 (54.7–63.7)	1.1 (1.0–1.3)	40.8 (36.3–45.3)	1.2 (1.0–1.4)			
20	321	66.7 (61.5–71.8)	<b>1.5 (1.3–1.8)</b>	71.3 (66.4–76.3)	<b>1.3 (1.2–1.5)</b>	56.4 (51.0–61.8)	<b>1.6 (1.4–1.9)</b>			
<b>Estimated household income of majority of patients<sup>c</sup></b>										
<\$50,000	419	45.1 (40.3–49.9)	Ref	61.8 (57.2–66.5)	Ref	37.5 (32.8–42.1)	Ref			
\$50,000–\$99,999	522	50.2 (45.9–54.5)	1.1 (1.0–1.3)	56.7 (52.4–61.0)	0.9 (0.8–1.0)	40.8 (36.6–45.0)	1.1 (1.0–1.3)			
\$100,000	448	51.8 (47.2–56.4)	1.2 (1.0–1.3)	54.9 (50.3–59.5)	0.9 (0.8–1.0)	40.6 (36.1–45.2)	1.1 (0.9–1.3)			
<b>Practitioners in practice<sup>d</sup></b>										
1-2	308	53.9 (48.3–59.5)	Ref	57.5 (51.9–63.0)	Ref	40.9 (35.4–46.4)	Ref			
3-5	388	48.7 (43.7–53.7)	0.9 (0.8–1.1)	59.0 (54.1–63.9)	1.0 (0.9–1.2)	41.5 (36.6–46.4)	1.1 (0.9–1.3)			
6-11	308	47.4 (41.8–53.0)	0.9 (0.8–1.1)	56.2 (50.6–61.7)	1.0 (0.8–1.2)	38.0 (32.6–43.4)	1.0 (0.8–1.3)			
12	385	47.3 (42.3–52.3)	1.0 (0.8–1.2)	57.7 (52.7–62.6)	1.0 (0.9–1.2)	38.4 (33.6–43.3)	1.1 (0.8–1.3)			
<b>Patient portal available</b>										
Yes	1,004	51.1 (48.0–54.2)	<b>1.2 (1.1–1.4)</b>	61.0 (57.9–64.0)	<b>1.3 (1.1–1.4)</b>	41.6 (38.6–44.7)	<b>1.2 (1.1–1.5)</b>			

PCP characteristics	Study n (denominator)	Always assesses PA		Always recommends PA		Both (always assesses and always recommends PA)	
		% (95% CI)	PR <sup>b</sup> (95% CI)	% (95% CI)	PR <sup>b</sup> (95% CI)	% (95% CI)	PR <sup>b</sup> (95% CI)
No or Unsure	385	44.2 (39.2–49.1)	Ref	49.1 (44.1–54.1)	Ref	34.8 (30.0–39.6)	Ref

PA: physical activity; PR: prevalence ratio; CI: confidence interval; PCP: primary care provider. Ref: referent group

<sup>a</sup>Multivariable-adjusted logistic regression models contained all sociodemographic and medical practice characteristics.

<sup>b</sup>Boldface indicates  $p < 0.05$ .

<sup>c</sup>Defined using the question: "Please select the category that best describes the approximate financial situation (household income) of the majority of your patients."

<sup>d</sup>Number of practitioners in practice includes survey respondents.