EJR European Journal of Rheumatology

DOI: 10.5152/eurjrheum.2025.24061

Original Article

Implementation Practices for the 2022 American College of Rheumatology Guidelines for Exercise, Rehabilitation, Diet, and Additional Integrative Interventions for Rheumatoid Arthritis

Laura Nichols[1,3], Austin Nickell[3], Ellen Wold[3], Abe Eric Sahmoun[3], Meghan Scheibe[2,3]

Abstract

Background: Given the significant burden of metabolic and functional diseases in rheumatoid arthritis, the American College of Rheumatology (ACR) released lifestyle guidelines in 2022 for exercise, rehabilitation, diet, and additional interventions in rheumatoid arthritis. This study aimed to investigate real-world implementation post-guidelines to identify gaps in adherence, as well as future directions for guideline-based interventions.

Methods: A retrospective chart review of adult patients presenting to the rheumatology department was performed at the institution between November 15, 2022, and February 15, 2023, the 3 months immediately following guideline release. Information on demographics, comorbidities, disease control, and immunomodulatory therapy was obtained. Referral patterns for physical therapy, occupational therapy, and behavioral health were reviewed, as well as recommendations for exercise and a Mediterranean diet. The baseline referral patterns were also examined in the year prior to guideline release for both rheumatology and non-rheumatology providers.

Results: This study included 791 individuals. In the post-guideline period, 3.5% of the patients received recommendations for an exercise program from a rheumatology provider, and 3.2% and 0.5% received referrals to physical therapy (PT) and occupational therapy (OT), respectively. Post-guideline dietary recommendations for the Mediterranean diet were provided to 0.5% of patients, while referrals to weight loss clinics and behavioral health services were less frequent, each being 0.1%.

Conclusion: At 3 months post-guideline release, adherence to the 2022 ACR lifestyle guidelines was low. Additional guideline education for providers and a reduction in barriers to implementation are needed.

Keywords: Lifestyle guideline, quality improvement, rheumatoid arthritis

ORCID iDs of the authors:
L.N. 0000-0003-0113-0109;
A.N. 0009-0006-0590-9661;
E.W. 0009-0002-0900-2275;
A.E.S. 0000-0003-2308-7738;
M.S. 0009-0002-0806-2479.

Cite this article as: Nichols L, Nickell A, Wold E, Sahmoun AE, Scheibe M. Implementation practices for the 2022 American College of Rheumatology guidelines for exercise, rehabilitation, diet, and additional integrative interventions for rheumatoid arthritis. *Eur J Rheumatol.* 2025, 12(3), 0061, doi: 10.5152/eurjrheum.2025.24061.

[1] Department of Internal Medicine, Sanford Health, North Dakota, United States
[2] Department of Rheumatology, Sanford Health, North Dakota, United States
[3] Department of Internal Medicine, University of North Dakota School of Medicine, North Dakota, United States

This study aimed to examine implementation practices of the 2022 American College of Rheumatology guidelines for exercise, rehabilitation, diet and additional interventions in rheumatoid arthritis 3 months post-guideline release. Adherence to guideline recommendations was low, indicating the need for clinician education and reduction in barriers to implementation

Corresponding author:
Laura Nichols
E-mail: laura.nichols@sanfordhealth.org

Received: July 19, 2024
Revision Requested: December 4, 2024
Last Revision Received: February 20, 2025
Accepted: April 15, 2025
Publication Date: September 22, 2025

Introduction

Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disease affecting 0.5%-1% of the global population.[1] While RA classically manifests as polyarticular arthritis, the associated inflammation can also result in an increased risk of cardiovascular disease (CVD) and mortality with a 1.5-2.0-fold increase in CVD compared to the general population, a risk level increase similar to diabetes.[2-4] Although 1 in every 5 deaths is due to cardiovascular disease in the general population, approximately 30% of patients with RA die from cardiovascular disease, making it the leading cause of death in patients with RA.[3,5] Therapy with glucocorticoids is additionally associated with hypertension, altered lipid profiles, carotid plaque formation, increased arterial stiffness, and reduced insulin sensitivity.[4] Given the cumulative risks of both the RA-associated inflammation and RA therapies, mitigation of cardiovascular risk should be a priority in RA management.

Obesity, an additional major contributor to cardiovascular disease, is also associated with RA.[6] There are known increases in proinflammatory cytokines in obesity, including tumor necrosis factor, interleukin-6 (IL-6), and leptin.[7,8] Furthermore, sarcopenia, either with or without obesity, is also more prevalent in RA patients compared to the general population.[9] A 2022 study found that the prevalence of sarcopenia among RA patients was 11 times higher compared to reference populations.[9] Additionally, sarcopenic obesity was found in 14.2% of RA patients, significantly higher than the 4%-4.5% prevalence found in controls.[10]

Both conditions were linked to reduced physical function, increased disability, and functional decline in RA patients.[10]

Although sarcopenia-related disability in RA, as well as disability related to chronic pain, leads to reduced functional capacity, regular exercise has been shown to reduce pain, enhance physical ability, and improve quality of life, mental health, and sleep in patients with RA.[11] Exercise is also known to decrease pro-inflammatory cytokines and increase antioxidants, which can mitigate the risk of CVD in RA patients.[11,12] Among the approaches studied, engagement in aerobic exercises has shown the strongest benefits.[11,13] Additional modalities that have been shown to decrease disease severity include whole-body cryotherapy and resistance exercises.[12,13]

Due to the significant burden of cardiovascular, metabolic, and disability-related morbidity and mortality in rheumatoid arthritis, guidance recommending targeted interventions to improve outcomes in RA has been developed over the last several years. The European Alliance of Associations for Rheumatology (EULAR) developed guidelines in 2021 regarding recommendations for lifestyle management of comorbidities and chronic disability in several rheumatic conditions, including rheumatoid arthritis.[14] Subsequently, in 2022, the American College of Rheumatology (ACR) released guidelines emphasizing the integration of dietary measures, exercise, rehabilitation, and mental health practices alongside standard disease-modifying anti-rheumatic drug (DMARD) therapies to mitigate the heightened risk of comorbidities and mortality associated with RA.[15]

While the importance of lifestyle interventions in RA is clear, implementation may be difficult in practice due to competing priorities in the form of other tasks, such as counseling on high-risk medications, addressing other guideline-based care, and prior authorizations. A recent simulation study performed in primary care demonstrated the need for a 27-hour workday to fully address guideline-recommended care for prevention as well as acute and chronic disease.[16] High workloads and physician shortages have led to a burnout rate among rheumatologists of around 50%.[17] Given the demands of clinical practice and the need to minimize administrative burden, it is important to understand how these guidelines are being implemented in real-world practice and develop creative strategies to increase adherence to guidelines while minimizing provider burden. This study aimed to assess adherence rates to the 2022 ACR guideline 3 months after implementation, with an emphasis on the diet, exercise, and rehabilitation categories. Understanding gaps in adherence is necessary to identify future directions for guideline-based interventions to increase the number of patients with RA receiving lifestyle referrals and recommendations.

Material and Methods

We identified patients seen within the rheumatology department at 1 urban site of the large community health system between November 15, 2022, and February 15, 2023, the 3 months immediately following guideline release. An electronic medical record (EMR)-extracted report and a manual chart review were utilized for data collection. The inclusion criteria were patients aged 18 years and older with a primary diagnosis of rheumatoid arthritis who received care within the rheumatology department at the institution from November 15, 2022, to February 15, 2023. Exclusion criteria included patients who died within the study period and those who had a rheumatologic diagnosis other than rheumatoid arthritis as their sole diagnosis. Patients were not excluded if they were diagnosed with rheumatoid arthritis and other conditions, such as lupus. A total of 791 patient charts were analyzed.

Referral patterns by rheumatology and non-rheumatology providers were analyzed for the 1-year period pre-guideline release and the 3 months post-guideline release. A look-back of 1 year was utilized given referrals during that timeframe could affect referral patterns in the 3 months post-guideline. Referrals from non-rheumatology providers (any physician or advanced practice provider) were included, as their recommendations could also influence the referral patterns of rheumatology providers. Furthermore, including non-rheumatology providers allowed a more comprehensive understanding of what rehabilitative and lifestyle-based referrals patients received within the entire health system. No guideline awareness intervention for providers occurred as part of the study protocol given the desire to understand guideline uptake under usual conditions.

The retrieved data included patient demographics, laboratory values (inflammatory markers, lipid panel, hemoglobin A1C, anti-citrullinated peptide antibodies, rheumatoid factor antibodies), additional comorbidities (osteoarthritis, type 2 diabetes, gout, psoriasis), referrals (weight loss clinic, dietitian, PT, OT, behavioral health clinic), and recommendations (Mediterranean diet, exercise). Additional data included the level of disease control, recent steroid need, and current immunosuppressive regimens. Disease control levels were independently verified by 2 rheumatologists. Race was assessed using the recorded race within the medical record. This study was approved by the ethics committee of Sanford Health (decision protocol STUDY00003171, February 6, 2023). Informed consent was not required for this study given the retrospective design. All relevant data are within the paper and its supporting information files. Mean (SD) values were calculated for all continuous variables, and frequency distributions were calculated for all categorical variables. Analyses were performed using the SAS software V9.4 (SAS Institute, Cary, NC, USA).

Results

This study included 791 individuals. The majority, 614 (77.6%), were female. The mean (SD) age of the patients was 62.3 (13.8) years, and the mean (SD) BMI was 31.3 (7.5) kg/m^2. The majority of the patients, 739 (94.6%), were white. Common comorbid conditions included osteoarthritis (53.9%), type 2 diabetes mellitus (15.9%), gout (5.1%), and psoriasis (3.4%) (Table 1). Table 1 shows that disease control varied among patients, with 47.2% of patients in clinical remission, 28.4% with low disease activity, and 24.4% with moderate-to-high disease activity. Of the patients, 55.6% received biologic or synthetic-targeted DMARD therapy, whereas 38.4% received conventional DMARDs alone. Of the patients, 2.3% were prescribed steroids alone, and 3.7% did not receive immunomodulatory therapy.

Table 2 summarizes the number and percentage of patients who received lifestyle recommendations and referrals by rheumatologists within 3 months of guideline release. In the post-guideline period, 3.5% of the patients received recommendations for an exercise program from a rheumatology provider, and 3.2% and 0.5% received referrals to PT and OT, respectively. Post-guideline dietary recommendations for the Mediterranean diet were provided to 0.5% of patients, while referrals to weight loss clinics and behavioral health services were less frequent, each being 0.1%. Although it was unable to directly compare pre- and post-guideline rates, the referral patterns in the year prior to guideline release demonstrated a relatively low level of baseline referrals, suggesting that a high rate of pre-guideline referrals was not the reason for low post-guideline referrals (Table 3).

Table 1. Demographics and Clinical Characteristics of Patients Diagnosed with Rheumatoid Arthritis

Variables	n (%)
Total	791 (100)
Age, mean (±SD)	62.3 (+/ - 13.8)
Sex	
Female	614 (77.6)
Male	177 (22.4)
Race	
Asian	3 (0.4)
Black	6 (0.8)
American Indian/Alaska Native	33 (4.23)
White	739 (94.6)
Disease Control	
Clinical remission	373 (47.2)
Low disease activity	225 (28.4)
Moderate-to-high disease activity	193 (24.4)
Comorbid Conditions	
Osteoarthritis	426 (53.9)
Gout	40 (5.1)
Psoriasis	27 (3.4)
Type 2 diabetes mellitus	126 (15.9)
Body mass index (kg/m^2), mean (±SD)	31.3 (+/ - 7.5)
Underweight (<18.5)	6 (0.8)
Normal (18.5-24.9)	158 (20.0)
Overweight (25-29.9)	207 (26.2)
Obesity (30-39.9)	316 (39.9)
Morbid obesity (40)	92 (11.6)
Underweight (<18.5)	12 (1.5)
Missing	6 (0.8)
Immunomodulatory Therapy	
Biologic or synthetic-targeted DMARD	440 (55.6)
Conventional DMARDs only	304 (38.4)
Steroid only	18 (2.3)
None	29 (3.7)

Discussion

The findings of this study highlight the state of adherence to the 2022 ACR guidelines for exercise, rehabilitation, diet, and integrative interventions for RA in a real-world clinical setting. To the authors' knowledge, this study provides the only real-world data on adherence to the 2022 ACR guidelines. The findings indicate that despite the emphasis placed on these modifications, there remains a notable gap in the implementation of these practices.

Table 2. Patients Receiving Lifestyle Recommendations and Referrals by Rheumatology Within 3 Months of Guideline Release

Intervention	n (%)
Exercise	
Any exercise recommendation	28 (3.5)
Rehabilitation	
Physical therapy referral	25 (3.2)
Occupational therapy referral	4 (0.5)
Dietary	
Mediterranean diet recommendation	4 (0.5)
Dietician referral	0
Additional	
Behavioral health referral	1 (0.13)

The strongest recommendation found in the 2022 ACR guidelines was engagement in exercise, which can mitigate the higher-than-average risk of CVD and sarcopenic obesity found in patients with RA.[15] Exercise promotes muscle strength and aids in weight loss, thereby improving mobility, functionality, and quality of life.[10,11] A randomized trial showed significant improvement in C-reactive protein and truncal fat in the exercise intervention group. They also found improved $V0_2Max$ levels, which have been shown to reduce the prevalence and severity of CVD in patients with RA.[18-20] Additional studies have reported similar improvements in cardiorespiratory rates in patients with RA in 3-month and 6-month trials assessing aerobic and resistance training.[19,20] Despite this evidence and the strong ACR recommendation for exercise, only 3.5% of the patients in this study received the recommendation for exercise.

The incorporation of restorative and integrative therapies, such as PT and OT, is a key feature of the 2022 ACR guidelines.[15] A randomized clinical trial showed that patients in PT, particularly those in aerobic exercise and strengthening programs, experienced notable reductions in joint pain and increased knee range of motion compared to controls after 8 weeks.[21] Regarding OT, there is strong evidence to support the effectiveness of "instruction on joint protection" and the concept that correct provisional splinting relieves joint pain.[22] The data showed a limited utilization of these practices, with 3.2% and 0.5% of patients receiving post-guideline referrals to PT and OT, respectively.

Another recommendation in the 2022 ACR guidelines is participation in cognitive behavioral therapy.[15] Despite even the most aggressive medical management for RA, many patients still experience discomforting psychological symptoms.[23] A systematic review and meta-analysis of 6 randomized control trials found that cognitive behavioral therapy (CBT) significantly reduces levels of anxiety, depression, and fatigue in patients with RA.[23,24] Leeuw et al[25] attributed the positive effects of CBT to the reduction in fear-avoidance behaviors in patients with musculoskeletal disorders. Patients with fear-avoidance behaviors often avoid certain activities due to fear of pain or injury, which can lead to further inactivity and exacerbate their disease state. Only 0.13% of the patients who visited a rheumatologist received a CBT referral post-guideline implementation in this study.

While the ACR conditionally recommends the Mediterranean diet, this study revealed that only 0.5% of patients received this recommendation, and no dietician referrals were placed post-guideline release.[15] Over 50% of the study population was diagnosed with either obesity or morbid obesity compared to 41.9% of the general population.[26] The Mediterranean diet is associated with a reduced risk of CVD, a concern for RA patients. Thus, besides treating RA, the Mediterranean diet may offer additional

Table 3. Patients Receiving Referrals for PT, OT and Behavioral Health in the Year Prior To Guideline Release

Referral	Rheumatology Providers n (%)	Non-Rheumatology Providers n (%)
Rehabilitation		
Physical therapy	51 (6.4)	109 (13.8)
Occupational therapy	20 (2.5)	45 (5.7)
Additional		
Behavioral health referral	17 (2.3)	45 (5.7)

benefits by reducing the likelihood of future complications.[27,28]

To the authors' knowledge, this study is the first to investigate adherence to the 2022 ACR guidelines and referral patterns between rheumatologists and non-rheumatologists in a real-world clinical setting. Low adherence rates highlight the challenges and barriers associated with implementing guideline-recommended interventions for RA management, including competing demands for both providers and patients. While this study demonstrated low guideline uptake for measured outcomes, it is likely that adherence will gradually improve over time due to the increased adoption of guideline recommendations as they become more widely known. However, there is room for consideration of targeted interventions that are mindful of provider burnout and the burden of ensuring adherence to multiple guidelines in practice when time is limited.

Improvement in guideline adherence and implementation will require a multifaceted and multidisciplinary approach. Several articles from the perspectives of therapists and patients were published alongside the ACR guideline.[29-32] One patient noted the importance of self-management in rheumatoid arthritis, which was echoed by physical therapists.[29,30] The patient article had an excellent suggestion to have quick response (QR) codes with links to pertinent patient articles available in the office.[29] Patients would then have the opportunity to request specific services in which they are interested during the visit. The physical therapy article specifically cited self-guided programs that have been developed for patients with RA by the Arthritis Foundation.[30] In addition to self-management, networking with therapists, dietitians, and other lifestyle health professionals is important in developing the multidisciplinary and coordinated approach that patient's desire.[29-31] Since the guideline release, the ACR has worked to educate providers through a series of several ACR on Air podcasts, including 2 on partnering with occupational and physical therapists and another on the importance of self-management.[33-35] Even prior to the guideline release, there were episodes on the effects of diet in rheumatic disease as well as the impact of exercise.[36,37] Future directions for continued work could include the implementation of integrated nurse navigators providing lifestyle intervention, development of order sets for an easy referral process, or simple interventions such as the creation of lifestyle dot phrases that provide patient education on lifestyle recommendations.

Continued study of guideline implementation should include an extended follow-up duration to help determine whether adherence patterns evolve over time as physicians become more familiar with the guidelines. Additionally, expanding the study to encompass multiple healthcare centers would allow determination of adherence rates adherence rates and referral patterns across different geographical regions and academic and community-based practices, where barriers to implementation may differ. Another direction could involve comparing adherence rates for ACR guidelines with guidelines for other chronic diseases, such as hypertension, which could identify common challenges and opportunities for enhancing guideline adherence across disease states. Future research should also evaluate the effectiveness of targeted interventions (i.e., implementation of educational programs for providers) in enhancing guideline implementation rates.

Study limitations include reliance on descriptive methods, a short follow-up period, utilization of data from a single center, the predominantly White population, reliance on manual chart reviews, and lack of pre-guideline data for exercise and the Mediterranean diet. Nonetheless, this study underscores the need to investigate barriers hindering the implementation of lifestyle interventions in RA management. Several factors may contribute to the observed low uptake, including patient preferences, clinician workload, and the complexity of RA management. Moreover, the recent release of these guidelines may require additional time for uptake by clinicians.

The adherence to the 2022 ACR lifestyle guidelines for RA is low. For the interventions studied, there were few referrals and recommendations post-guideline, suggesting a gap between guideline publication and implementation. Although there was more obesity in the patients compared to the general population, only a handful of patients received dietary intervention from their rheumatology clinician.[26] Future work is needed to create practical recommendations for patients with RA that balance patient needs and provider workload. By addressing these issues, physicians can improve disease outcomes and quality of life in patients with RA.

Data Availability Statement: All relevant data are within the paper and its supporting information files.

Ethics Committee Approval: This study was approved by the Ethics Committee of Sanford Health (Approval No.: STUDY00003171; Date: February 6, 2023).

Informed Consent: N/A.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – L.N., M.S.; Design – L.N., M.S., A.E.S.; Supervision – L.N., M.S., A.E.S.; Resources – L.N., E.W., A.N.; Materials – L.N. E.W., A.N.; Data Collection and/or Processing – L.N., E.W., A.N.; Analysis and/or Interpretation – L.N., M.S., A.E.S., E.W., A.N.; Literature Search – L.N., E.W., A.N.; Writing – L.N., E.W., A.N.; Critical Review – L.N., M.S., A.E.S., E.W., A.N.

Declaration of Interests: The authors have no conflict of interest to declare.

Funding: The authors declared that this studyhas received no financial support.

References

1. Alamanos Y, Drosos AA. Epidemiology of adult rheumatoid arthritis. *Autoimmun Rev*. 2005;4(3):130-136. [CrossRef]
2. Houge IS, Hoff M, Thomas R, Videm V. Mortality is increased in patients with rheumatoid arthritis or diabetes compared to the general population - the Nord-Trøndelag Health Study. *Sci Rep*. 2020;10(1):3593. [CrossRef]
3. Kelly C, Hamilton J. What kills patients with rheumatoid arthritis? *Rheumatol (Oxf Engl)*. 2007;46(2):183-184. [CrossRef]
4. Crowson CS, Liao KP, Davis JM 3rd, et al. Rheumatoid arthritis and cardiovascular disease. *Am Heart J*. 2013;166(4):622-628.e1. [CrossRef]
5. Heart disease Facts; Updated May 15. 2023. Centers for Disease Control and Prevention. Accessed May 13, 2024. https://www.cdc/gov/heartdisease/facts.htm.
6. Crowson CS, Matteson EL, Davis JM 3rd, Gabriel SE. Contribution of obesity to the rise in incidence of rheumatoid arthritis. *Arthritis Care Res (Hoboken)*. 2013;65(1):71-77. [CrossRef]
7. Bastard JP, Jardel C, Bruckert E, et al. Elevated levels of interleukin 6 are reduced in serum and subcutaneous adipose tissue of obese women after weight loss. *J Clin Endocrinol Metab*. 2000;85(9):3338-3342. [CrossRef]
8. Tilg H, Moschen AR. Adipocytokines: mediators linking adipose tissue, inflammation and immunity. *Nat Rev Immunol*. 2006;6(10):772-783. [CrossRef]
9. Dietzel R, Wiegmann S, Borucki D, et al. Prevalence of sarcopenia in patients with rheumatoid arthritis using the revised EWGSOP2 and the FNIH definition. *RMD Open*. 2022;8(2):e002600. [CrossRef]
10. Baker JF, Giles JT, Weber D, et al. Sarcopenic obesity in rheumatoid arthritis: prevalence and impact on physical functioning. *Rheumatol (Oxf Engl)*. 2022;61(6):2285-2294. [CrossRef]
11. Li Z, Wang XQ. Clinical effect and biological mechanism of exercise for rheumatoid arthritis:

A mini review. *Front Immunol*. 2023;13:1089621. [CrossRef]
12. Wen Z, Chai Y. Effectiveness of resistance exercises in the treatment of rheumatoid arthritis: A meta-analysis. *Med (Baltim)*. 2021;100(13):e25019. [CrossRef]
13. Peres D, Sagawa Y Jr, Dugué B, Domenech SC, Tordi N, Prati C. The practice of physical activity and cryotherapy in rheumatoid arthritis: systematic review. *Eur J Phys Rehabil Med*. 2017;53(5):775-787. [CrossRef]
14. Gwinnutt JM, Wieczorek M, Balanescu A, et al. 2021 EULAR recommendations regarding lifestyle behaviours and work participation to prevent progression of rheumatic and musculoskeletal diseases. *Ann Rheum Dis*. 2023;82(1):48-56. [CrossRef]
15. England BR, Smith BJ, Baker NA, et al. 2022 American College of Rheumatology guideline for exercise, rehabilitation, diet, and additional integrative interventions for rheumatoid arthritis. *Arthritis Care Res (Hoboken)*. 2023;75(8):1603-1615. [CrossRef]
16. Porter J, Boyd C, Skandari MR, Laiteerapong N. Revisiting the time needed to provide adult primary care. *J Gen Intern Med*. 2023;38(1):147-155. [CrossRef]
17. The Lancet. Battling burnout. *Lancet Rheumatol*. 2022;4(3):e153. [CrossRef]
18. Azeez M, Clancy C, O'Dwyer T, Lahiff C, Wilson F, Cunnane G. Benefits of exercise in patients with rheumatoid arthritis: a randomized controlled trial of a patient-specific exercise programme. *Clin Rheumatol*. 2020;39(6):1783-1792. [CrossRef]
19. Stavropoulos-Kalinoglou A, Metsios GS, Veldhuijzen van Zanten JJ, Nightingale P, Kitas GD, Koutedakis Y. Individualised aerobic and resistance exercise training improves cardiorespiratory fitness and reduces cardiovascular risk in patients with rheumatoid arthritis. *Ann Rheum Dis*. 2013;72(11):1819-1825. [CrossRef]
20. Strasser B, Leeb G, Strehblow C, Schobersberger W, Haber P, Cauza E. The effects of strength and endurance training in patients with rheumatoid arthritis. *Clin Rheumatol*. 2011;30(5):623-632. [CrossRef]
21. Rahnama N, Mazloum V. Effects of strengthening and aerobic exercises on pain severity and function in patients with knee rheumatoid arthritis. *Int J Prev Med*. 2012;3(7):493-498.
22. Steultjens EM, Dekker J, Bouter LM, van Schaardenburg D, van Kuyk MA, van den Ende CH. Occupational therapy for rheumatoid arthritis. *Cochrane Database Syst Rev*. 2004;2004(1):CD003114. [CrossRef]
23. Shen B, Li Y, Du X, et al. Effects of cognitive behavioral therapy for patients with rheumatoid arthritis: a systematic review and meta-analysis. *Psychol Health Med*. 2020;25(10):1179-1191. [CrossRef]
24. Sharpe L. Psychosocial management of chronic pain in patients with rheumatoid arthritis: challenges and solutions. *J Pain Res*. 2016;9:137-146. [CrossRef]
25. Leeuw M, Goossens ME, Linton SJ, Crombez G, Boersma K, Vlaeyen JW. The fear-avoidance model of musculoskeletal pain: current state of scientific evidence. *J Behav Med*. 2007;30(1):77-94. [CrossRef]
26. Adult obesity facts; Updated May 17, 2022. Centers for Disease Control and Prevention. Accessed May 13, 2024. https://www.cdc.gov/obesity/data/adult.html#:~:text=The%20obesity%20prevalence%20was%2039.8,adults%20aged%2060%20and%20older.
27. Forsyth C, Kouvari M, D'Cunha NM, et al. The effects of the Mediterranean diet on rheumatoid arthritis prevention and treatment: a systematic review of human prospective studies. *Rheumatol Int*. 2018;38(5):737-747. [CrossRef]
28. Panagiotakos DB, Georgousopoulou EN, Pitsavos C, et al. Ten-year (2002-2012) cardiovascular disease incidence and all-cause mortality, in urban Greek population: the Attica Study. *Int J Cardiol*. 2015;180:178-184. [CrossRef]
29. Constien D, Davidson E, Phillips LR. Patient perspectives on the 2022 American College of Rheumatology guideline for exercise, rehabilitation, diet, and additional integrative interventions for rheumatoid arthritis. *Arthritis Care Res (Hoboken)*. 2023;75(8):1616-1617. [CrossRef]
30. Thoma LM, Li LC, White DK, Oatis C. Physical therapists play a key role in the comprehensive management of rheumatoid arthritis. *Arthritis Care Res (Hoboken)*. 2023;75(8):1625-1628. [CrossRef]
31. Baker NA, Carandang K, Dodge C, Poole JL. Occupational therapy is a vital member of the interprofessional team-based approach for the management of rheumatoid arthritis: applying the 2022 American College of Rheumatology guideline for exercise, rehabilitation, diet, and additional integrative interventions for rheumatoid arthritis. *Arthritis Care Res (Hoboken)*. 2023;75(8):1618-1624. [CrossRef]
32. Everett S. 2022 American College of Rheumatology (ACR) guideline for exercise, rehabilitation, diet, and additional integrative interventions for rheumatoid arthritis. *Arthritis Care Res (Hoboken)*. 2023;75(8):1629-1630. [CrossRef]
33. Hausmann J. Partnering with your occupational therapist. *ACR on Air*; February 13, 2024. Accessed December 29, 2024. https://acronair.libsyn.com/partnering-with-your-occupational-therapist.
34. Hausmann J. Partnering with your physical therapist. *ACR on Air*; July 16, 2024. Accessed December 29, 2024. https://acronair.libsyn.com/size/5/?search=physical+therapist.
35. Hausmann J. Rheumatic disease awareness month: the importance of self-management. *ACR on Air*; September 10, 2024. Accessed December 29, 2024. https://acronair.libsyn.com/size/5/?search=self-management.
36. Guma M. The impact of diet on rheumatic conditions. *ACR on Air*; May 18, 2021. Accessed December 29, 2024. https://acronair.libsyn.com/22-can-diet-really-help-treat-rheumatic-conditions.
37. Hausmann J. The importance of physical activity for people with rheumatic diseases. *ACR on Air*; June 7, 2022. Accessed December 29, 2024. https://acronair.libsyn.com/30-importance-of-physical-activity-for-people-with-rheumatic-diseases.