BMJ Open

Patient preferences for drug therapy in inflammatory arthritis: protocol for a living systematic review and evidence map to inform clinical practice guidelines

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2024-088267
Article Type:	Protocol
Date Submitted by the Author:	01-May-2024
Complete List of Authors:	Saadat, Pakeezah; University of Toronto Bansback, Nick; The University of British Columbia Falahee, Marie; University of Birmingham Hiligsmann , Mickaël ; Maastricht University, Department of Health Services Research Tugwell, Peter; University of Ottawa Faculty of Medicine, Department of Medicine Buchbinder, Rachelle; Monash University Whittle, Samuel; Monash University Richards, Dawn P.; Canadian Arthritis Patient Alliance Proulx, Laurie ; Canadian Arthritis Patient Alliance Schunemann, Holger; Hamilton, Department of Health Research Methods, Evidence and Impact; Hamilton, Department of Medicine Alonso-Coello, Pablo; Instituto de Investigacion Biomedica Nieuwlaat, Robby; Hamilton, Department of Medicine; Hamilton Wiercioch, Wojtek; Hamilton, Department of Medicine; Hamilton Kuper, Simon; Maastricht University Pardo Pardo, Jordi; University of Ottawa Hazlewood, Glen; University of Calgary, Departments of Medicine and Community Health Sciences
Keywords:	Patients, RHEUMATOLOGY, Systematic Review

Patient preferences for drug therapy in inflammatory arthritis: protocol for a living systematic review and evidence map to inform clinical practice guidelines

Pakeezah Saadat,[1] pakeezah.saadat@mail.utoronto.ca
Nick Bansback,[2] nick.bansback@ubc.ca
Marie Falahee,[3] m.falahee@bham.ac.uk
Mickael Hiligsmann,[4] m.hiligsmann@maastrichtuniversity.nl
Peter Tugwell,[5] ptugwell@uottawa.ca
Rachelle Buchbinder,[6] rachelle.buchbinder@monash.edu
Samuel Whittle,[7] samuelwhittle@gmail.com
Dawn P Richards,[8] dawn.p.richards@gmail.com
Laurie Proulx,[8] laurieproulx@bell.net
Holger Schunemann,[9,10] holger.schunemann@mcmaster.ca
Pablo Alonso Coello,[11] palonso@santpau.cat
Robby Nieuwlaat,[10,12] nieuwlr@mcmaster.ca
Wojtek Wiercioch,[10,12] wierciww@mcmaster.ca
Simon Kuper,[13] simon.kuper97@gmail.com
Jordi Pardo Pardo,[14] jpardo@uottawa.ca
Glen S Hazlewood[15] gshazlew@ucalgary.ca

[1]Institute of Health Policy, Management, and Evaluation, University of Toronto, Toronto, ON, Canada
[2]School of Population and Public Health, University of British Columbia, BC, Canada; Arthritis Research Canada, Richmond, BC, Canada
[3]Rheumatology Research Group, Institute of Inflammation and Ageing, College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK; NIHR Birmingham Biomedical Research Centre, University Hospitals Birmingham NHS Foundation Trust and University of Birmingham, Birmingham, UK
[4]Department of Health Services Research, CAPHRI Care and Public Health research Institute, Maastricht University, Netherlands
[5]Department of Medicine, University of Ottawa Faculty of Medicine, Ottawa, ON, Canada; Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, ON, Canada
[6]Musculoskeletal Health and Wiser Health Care Units, School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia
[7]School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia; Rheumatology Unit, Queen Elizabeth Hospital, Adelaide, Australia
[8]Canadian Arthritis Patient Alliance, Toronto, ON, Canada
[9]Department of Health Research Methods, Evidence and Impact, McMaster University, Health Sciences Centre, Hamilton, ON, Canada
[10]Department of Medicine, McMaster University, Health Sciences Centre, Hamilton, ON L8S 4K1, Canada; Department of Biomedical Sciences, Humanitas University, Milano, Italy
[11]Centro GRADE Barcelona, Instituto de Investigacion Biomedica (IIB Sant Pau), Barcelona, Spain
[12]World Health Organization Collaborating Center for Infectious Diseases, Research Methods and Recommendations, Michael G. DeGroote Cochrane Canada & McMaster GRADE Centres; McMaster University, Hamilton, ON, Canada
[13] Faculty of Health, Medicine and Life Sciences, Maastricht University, Germany
[14]Cochrane Musculoskeletal, Faculty of Medicine, University of Ottawa, Ottawa, Ontario, Canada

[15]Departments of Medicine and Community Health Sciences, Cumming School of Medicine, University of Calgary, Calgary, AB, Canada; Arthritis Research Canada, Richmond, BC, Canada; McCaig Institute for Bone and Joint Health, Calgary, Canada

Corresponding Author:

Glen S Hazlewood, gshazlew@ucalgary.ca

3280 Hospital Dr NW
3AA10 HRIC
Calgary AB T2N4Z6
Canada

Competing interests:

Pakeezah Saadat: None relevant to the content of this study.

Nick Bansback: None relevant to the content of this study.

Marie Falahee: None relevant to the content of this study.

Mickael Hiligsmann: None relevant to the content of this study.

Peter Tugwell: None relevant to the content of this study.

Rachelle Buchbinder: None relevant to the content of this study.

Samuel Whittle: None relevant to the content of this study.

Dawn Richards: None relevant to the content of this study.

Laurie Proulx: None relevant to the content of this study.

Holger Schunemann: None relevant to the content of this study.

Pablo Alonso Coello: None relevant to the content of this study.

Robby Nieuwlaat: None relevant to the content of this study.

Wojtek Wiercioch: None relevant to the content of this study.

Simon Kuper: None relevant to the content of this study.

Jordi Pardo Pardo: None relevant to the content of this study.

Glen S Hazlewood: None relevant to the content of this study.

Word count: 2151

ABSTRACT

Introduction: The pharmacological management of inflammatory arthritis often requires individuals to make choices that involve trade-offs. These choices entail selecting treatments with varying benefits, risks, and other attributes such as administration route, frequency and cost. This living systematic review aims to inform international clinical guidelines on inflammatory arthritis by creating an evidence map of patient preference studies concerning the trade-offs in pharmacological management of inflammatory arthritis.

Methods and analysis: We will search Medline and EMBASE for any published and peer-reviewed full-text studies that quantitatively assess preferences of patients for the pharmacological management of inflammatory arthritis. Two independent reviewers will perform abstract and full-text screening. Studies that utilize either stated- or revealed-preference methods to assess preferences and provide a quantitative assessment of relevant characteristics, such as benefits, risks, costs, and process attributes, will be included. Risk of bias will be assessed using the GRADE risk of bias tool. An evidence map will be generated to summarize included studies and their assessments of each trade-off. The search will be conducted every 6 months with new studies added to the inventory.

Ethics and dissemination: This study does not require ethics approval. Findings from this study will be disseminated widely to relevant stakeholders via conference presentations, journal publications, and will also be made accessible on an Open Access website.

Key words: inflammatory arthritis, patient preference, trade-off, living systematic review

Word count: 215

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This living systematic review of patient preference studies will inform international clinical guidelines for inflammatory arthritis.
- Biannual updates will be conducted to promptly integrate emerging evidence, facilitating the maintenance of up-to-date clinical guidelines for inflammatory arthritis.
- Since the field is still evolving, the search strategy and data presentation will be adapted to incorporate newly emerging evidence.
- We will not meta-analyze the relative importance of each attribute as quantitative synthesis poses a challenge due to significant heterogeneity in study designs and attributes.

INTRODUCTION

Treatment choices in inflammatory arthritis nearly always involve trade-offs. People living with inflammatory arthritis need to choose between treatments that can differ in their benefits, risks, and other characteristics such as route of administration, frequency, and cost. For example, in rheumatoid arthritis, “triple therapy” with methotrexate, sulfasalazine and hydroxychloroquine has additional burden in terms of more pills, potentially more adverse effects, but an improved chance of a treatment response over methotrexate alone [1 2]. Tofacitinib, a JAK inhibitor, has been shown to have a higher risk of cardiovascular adverse events and certain malignancies in people at risk for cardiovascular events [3], but is available as a pill and is an effective option for many patients. For people with psoriatic arthritis, certain treatments may work better for different disease manifestations, such as skin disease or enthesitis, and this needs to be balanced against the control of their joint disease [4 5]. Corticosteroids offer rapid improvement for many patients with inflammatory arthritis, but long-term use is associated with multiple risks [6].

Patient preferences can be assessed or measured in multiple ways. Qualitative approaches can help understand how patients approach the decision-making process and the relevant considerations for a given healthcare decision [7]. Quantitative approaches provide numerical estimates of patient preferences for different treatments or treatment attributes, including risks and benefits and other considerations, such as route of administration or cost [8 9]. Quantitative methods can be categorized into revealed preference methods that measure which treatment people choose when presented with an actual choice, or stated preference methods that ask patients to rate, rank, or choose between hypothetical treatment options or

attributes. Stated preference methods can be further categorized according to different frameworks [8 10]. Revealed preference methods, where actual choices of participants are recorded are challenging, as real-world choices are often influenced by the healthcare providers' recommendations or restrictions imposed by insurance plans. Hence, most studies use stated preference methods.

When developing clinical practice guidelines, it is important to understand patient preferences for the relevant trade-offs. Under the GRADE approach, patient values and preferences are a key consideration in the Evidence to Decision framework, when deciding on the direction and strength of a recommendation [11]. While not often done, a systematic review of patient preference studies is recommended to inform these judgements [12]. Quantitative estimates of patient preferences are desired, as guideline panels need to consider which outcomes or other attributes are most important and by how much. When a guideline panel is confident that based on the balance of benefits and harms nearly all patients would choose a particular course of action then a strong recommendation can be made. Otherwise, a conditional recommendation is made, either for or against the treatment.

We have recently started living clinical guidelines for inflammatory arthritis in both Canada [13 14] and Australia [15-17]. In a living clinical practice guideline, treatment recommendations are kept up to date as new evidence emerges [18]. Within an entire guideline, individual recommendations may remain stable, whereas others may be updated in a living mode through living systematic reviews of the risks and benefits, which we have initiated for inflammatory arthritis [19]. Each time a recommendation is added, or new evidence emerges, guideline panels need to either make or update their judgements regarding the balance of risks and benefits. In a living model,

this requires regular updates of the evidence on patient preferences. New preference studies may have been published, and treatments may have new attributes, such as newly discovered risks. For example, in our inflammatory arthritis guidelines, our recommendation for choices of treatment after an inadequate response to anti-TNF therapy [14 15] required an update to our prior systematic review on patient preferences [20 21], given the risks of malignancy and cardiovascular events with JAK inhibitors. We did not find any studies that measured preferences for these trade-offs, but this evidence will likely emerge over time.

The aim of this systematic review will be to develop a living evidence map of patient preference studies as they relate to the treatment of inflammatory arthritis. By "evidence map" we mean a catalogue of studies that are characterized in terms of their characteristics and methods used, risk of bias, and which outcomes or other treatment attributes they included. We do not intend to summarize or meta-analyze the relative importance of each attribute, which is often challenging due to study heterogeneity. Rather, the intention is that guideline developers can use the evidence map to identify and review the studies relevant to their context to help inform clinical guideline recommendations.

METHODS

This protocol adheres to the PRISMA-P checklist[22].

Eligibility criteria

Population

We will include any study that provides a quantitative assessment of patients' preferences for the management of inflammatory arthritis. Inflammatory arthritis includes rheumatoid arthritis,

juvenile idiopathic arthritis, and spondyloarthritis, as defined by the study authors. Spondyloarthritis includes psoriatic arthritis, ankylosing spondylitis, reactive arthritis, enteropathic arthritis, and axial and/or peripheral spondyloarthritis not otherwise classified. We will include studies that have at least 75% of the included participants with inflammatory arthritis.

Outcomes

To be included, a study must include a quantitative assessment of the importance of attributes relevant to the pharmacologic and non-pharmacologic management of inflammatory arthritis. This includes treatment benefits, risks, and process attributes. Process attributes include any aspect related to care delivery, such as route and frequency of administration, access to care, and costs. Preferences may be assessed for attributes separately, or together, as would be the case when presenting patients with a 'real-world' choice between treatment options that differ across multiple characteristics (i.e., in revealed preference studies). We will exclude studies that exclusively provide an estimate of patients' health-related quality of life (HRQOL). HRQOL measures the value a patient places on their current health state and not their preference for potential treatment outcomes or attributes [23 24].

Study design

We will include any published and peer-reviewed full-text study in any language that assessed preferences using stated-preference methods [10] (where participants are asked their preferences for hypothetical choices) or revealed-preference methods (where the actual choices of patients are observed after being presented with a decision-aid) [8]. The stated-preference methods categorized by Soekhai et al. [10] consist of four distinct categories (**Table 1**).

Discrete-choice experiments examine trade-offs between attributes and their alternatives given a series of choice sets. Ranking methods are used to elicit an order of attributes and their alternatives through ranking exercises, such as best-worst scaling. Indifference methods, such as time trade-off or standard gamble, manipulate attribute values until the participant is indifferent, or has no preference. Rating methods ask people to choose the strength of their preference using a labeled scale. We will exclude abstracts, pre-print articles and studies that have not been peer-reviewed.

Table 1. Inventory of patient-preference methods, adapted from Soekhai et al. [10]

Category	Method
Discrete-choice-based methods	Discrete choice experiment/Best-worst scaling (type 3)
	Adaptive conjoint analysis
Ranking methods	Qualitative discriminant process
	Q-methodology
	Control preferences scale
	Best-worst scaling (type 1 & 2)
	Self-explicated conjoint
Indifference methods	Standard gamble
	Time trade-off
	Person trade-off
	Starting known efficacy
	Test trade-off
	(Probabilistic) threshold technique
	Contingent valuation
Rating methods	Constant sum scaling
	Repertory grid method
	Analytic hierarchy process
	Swing weighting
	Visual analog scale
	Allocation of points
	Outcome prioritization tool
	Measure of value
Revealed preferences	Patient preference trials
	Direct questions in clinical trials

Living review considerations: If new preference-based approaches are identified or developed over time, these will be added to the eligibility criteria. Our search (described below) is also designed to identify qualitative studies, which would allow us to expand the scope of work in the future.

Information sources and search strategy

We will search the following databases from inception: Medline In Process and Other Non-indexed Citations, and EMBASE (Excerta Medica Database). The search strategy is presented in **Appendix A** and combines keywords and subject headings for inflammatory arthritis and preference-based methods. The MEDLINE and EMBASE inflammatory arthritis filters were derived from Cochrane reviews and adapted for the other databases. The preference-based method filter was derived from Selva et al [25] and supplemented with additional filters to capture all methods in Table 1, as well as qualitative studies. Additionally, we will search the Health Preference Study and Technology Registry (HPSTR; https://hpstr.org/), a web-based registry of health preference studies and technologies, using keywords for each population of interest (defined above).

Living review considerations: The search filters will be reviewed periodically and updated as needed, particularly if new validated filters for preference studies are published that suit our purpose. For the base review, the search will be conducted once, then updated prior to publication, after which the review will transition to a living mode. In the living mode, the search will be updated every 6 months, with the frequency adjusted as needed based on the usefulness and feasibility.

Article screening

The titles and abstracts of all records will first be screened for eligibility independently by two reviewers. Any record that either reviewer marks as unclear or included will proceed to full-text review. Full-text review will also be done by pairs of reviewers working independently. Any disagreement at the full-text stage will be discussed between reviewers and with senior reviewer(s) as necessary. At the full-text stage, articles will be excluded in the following

hierarchy: wrong publication type (e.g. pre-print, abstract); wrong population; wrong study design (not a preference-elicitation method); preferences for other aspects of care (e.g., diagnostic approaches). Articles in a different language will be translated into English. An example PRISMA flow-chart is presented in **Figure 1**.

Living review considerations: We will explore the incorporation of technologies to improve the efficiency of the article screening process, including automation, machine learning and crowd sourcing. We have employed these tools in other reviews of interventions [19 26], but to our knowledge they have not yet been developed for patient preference literature. It is our hope that the results of our review could be used to develop automated approaches for the screening of records. We will flag potentially eligible qualitative studies in the correct population, which would allow us to expand the scope of work in the future without having to rescreen all records.

Data extraction

Study data will be extracted independently by two team members. From each study we will extract relevant study and participant characteristics as listed in **Appendix B** if reported. Study characteristics include details on the population of interest, setting, response rate, recruitment strategy, funding, statistical analysis used, attribute selection process, and preference-elicitation methods. Participant characteristics include age, sex/gender, disease duration and severity, health literacy and sociodemographic characteristics, particularly those that would identify patient populations at risk for inequities in care. In prior studies, we have identified the following seven priority populations for guidelines in rheumatoid arthritis [27 28]: rural and remote residents, Indigenous Peoples, elderly persons with frailty, first-generation immigrants and

refugees, persons of low socioeconomic status or who are vulnerably housed, sex and gender diverse populations, and Black Canadians (added since our original framework[29]).

For each study, we will extract the attributes and levels evaluated, including a short description and the actual description presented in the survey to participants. The results of the study will be extracted as the estimated value for each attribute value, including the point estimate (mean/median), scale, and measure of variability. If this data is not presented it will calculate from the available data, if possible. Otherwise, we will extract the data as reported by the study (e.g. relative importance, ranks of attribute importance). We will extract measures of variability in the following order depending on availability: standard deviations (SDs), standard errors (SEs), 95% confidence intervals (Cis) or credible intervals (CrI), and exact *P*-values with the statistical test used. Data screening and extraction will be done via Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia, available at www.covidence.org).

Living review considerations: Depending on the volume of studies identified, the timing of data extraction for each study may need to be staged, prioritizing those studies that are most relevant to inform our living guidelines. We will include a table of studies pending data extraction and risk of bias assessment in the review.

Risk of bias

The risk of bias in each study will be assessed using the GRADE risk of bias tool for value and preference studies, which has been developed and validated, and is being finalized for publication. Assessment will be done independently by two team members and any discrepancies will be resolved through consensus.

Living review considerations: If preferred risk of bias tools change over time, these will be incorporated in the review.

Data presentation

Study characteristics will be summarized descriptively in a table. An evidence map will be generated that summarizes the current literature in terms of which available studies assess each trade-off. An example is included in **Table 2**. The rows and columns will contain all attributes assessed. Attributes will be grouped into categories by two independent reviewers with help from a senior reviewer, if needed. Each cell will list the study(s) that included those attributes. Studies that include absolute anchors of attribute importance, such as a standard gamble, time trade-off or visual analogue scales, will be included in the bottom row. This would allow guideline panels to easily identify potential studies that would be relevant for their purpose and help identify gaps in the evidence.

Living review considerations: We will explore the value of including additional information within each cell of the evidence map (e.g., sample size and risk of bias), and alternative ways of summarizing the data to guideline panels, including interactive evidence maps that would provide more flexibility.

Table 2. Example of the evidence map displaying studies that have included each pair of attribute.

		Benefits			Risks			Process		
		Remission	Pain reduction	Prevention of joint damage	GI side effects	Serious side effects	Injection site reaction	Route of delivery	Frequency	Cost
Benefits	Remission	-	-	-	-	-	-	-	-	-
	Pain reduction	[Study IDs]	-	-	-	-	-	-	-	-
	Prevention of joint damage	[Study IDs]	[Study IDs]	-	-	-	-	-	-	-
Risks	GI side effects	[Study IDs]	[Study IDs]	[Study IDs]	-	-	-	-	-	-
	Serious side effects	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	-	-	-	-	-
	Injection site reaction	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	-	-	-	-
Process	Route of delivery	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	-	-
	Frequency	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	-
	Cost	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	-
	Absolute anchor of importance	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]

Patient and Public Involvement:

This protocol was reviewed and refined with feedback from our patient partners, Dawn P Richards and Laurie Proulx, who are individuals living with rheumatoid arthritis/juvenile idiopathic arthritis.

Ethics and dissemination

Ethics approval is not required. Results from the base review will be published in a peer-reviewed journal. In the living model, we will publish updates and datasets on an Open Science Framework page with periodic updates in peer-reviewed journals.

Author contributions

GSH is the guarantor. GSH conceptualized the study, and designed and reviewed the protocol with PS. PS and GSH drafted the study, defined the concepts, search strategy, data extraction process, methodological appraisal, and statistical analysis of the included studies. NB, MF, MH, PT, RB, SW, DR, LP, HS, PAC, RB, WW, SK, and JPP provided critical insights. All authors have approved and contributed to the final written manuscript.

Funding statement

This protocol received no specific grant from any funding agency in the public, commercial or not-for-profit sectors. Funding is being sought for the review.

RB is supported by an Australian National Health and Medical Research Council (NHMRC) Investigator Fellowship (APP1194483). SW is supported by an Australia and New Zealand Musculoskeletal (ANZMUSC) Clinical Trial Network Practitioner Fellowship and by a grant from The Hospital Research Foundation Group.

REFERENCES

1. Hazlewood GS, Barnabe C, Tomlinson G, et al. Methotrexate monotherapy and methotrexate combination therapy with traditional and biologic disease modifying antirheumatic drugs for rheumatoid arthritis: abridged Cochrane systematic review and network meta-analysis. *BMJ* 2016;353:i1777. doi: 10.1136/bmj.i1777 [published Online First: 2016/04/23]
2. Hazlewood GS, Barnabe C, Tomlinson G, et al. Methotrexate monotherapy and methotrexate combination therapy with traditional and biologic disease modifying anti-rheumatic drugs for rheumatoid arthritis: A network meta-analysis. *Cochrane Database Syst Rev* 2016(8):CD010227. doi: 10.1002/14651858.CD010227.pub2 [published Online First: 2016/08/30]
3. Ytterberg SR, Bhatt DL, Mikuls TR, et al. Cardiovascular and Cancer Risk with Tofacitinib in Rheumatoid Arthritis. *N Engl J Med* 2022;386(4):316-26. doi: 10.1056/NEJMoa2109927 [published Online First: 2022/01/27]
4. Coates LC, Soriano ER, Corp N, et al. Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA): updated treatment recommendations for psoriatic arthritis 2021. *Nat Rev Rheumatol* 2022;18(8):465-79. doi: 10.1038/s41584-022-00798-0 [published Online First: 2022/06/28]
5. Singh JA, Guyatt G, Ogdie A, et al. Special Article: 2018 American College of Rheumatology/National Psoriasis Foundation Guideline for the Treatment of Psoriatic Arthritis. *Arthritis Rheumatol* 2019;71(1):5-32. doi: 10.1002/art.40726 [published Online First: 2018/12/01]
6. Rice JB, White AG, Scarpati LM, et al. Long-term Systemic Corticosteroid Exposure: A Systematic Literature Review. *Clin Ther* 2017;39(11):2216-29. doi: 10.1016/j.clinthera.2017.09.011 [published Online First: 2017/10/23]
7. Gooberman-Hill R. Qualitative approaches to understanding patient preferences. *Patient* 2012;5(4):215-23. doi: 10.1007/BF03262494 [published Online First: 2012/09/26]
8. Medical device Innovation Consortium (MDIC). Medical device Innovation Consortium (MDIC) Patient Centered Benefit-Risk Project Report: A Framework for Incorporating Information on Patient Preferences Regarding Benefit and Risk into Regulatory Assessments of New Medical Technology 2015 [updated March 11, 2022. Available from: https://mdic.org/project/patient-centered-benefit-risk-pcbr/ accessed 5 Sept 2023.
9. Hazlewood GS. Measuring Patient Preferences: An Overview of Methods with a Focus on Discrete Choice Experiments. *Rheumatic Diseases Clinics of North America* 2018;44(2):337-47. doi: https://dx.doi.org/10.1016/j.rdc.2018.01.009
10. Soekhai V, Whichello C, Levitan B, et al. Methods for exploring and eliciting patient preferences in the medical product lifecycle: a literature review. *Drug Discov Today* 2019;24(7):1324-31. doi: 10.1016/j.drudis.2019.05.001 [published Online First: 2019/05/12]
11. Montori VM, Brito JP, Murad MH. The optimal practice of evidence-based medicine: incorporating patient preferences in practice guidelines. *JAMA* 2013;310(23):2503-4. doi: 10.1001/jama.2013.281422 [published Online First: 2013/10/30]

12. Andrews JC, Schunemann HJ, Oxman AD, et al. GRADE guidelines: 15. Going from evidence to recommendation-determinants of a recommendation's direction and strength. *J Clin Epidemiol* 2013;66(7):726-35. doi: 10.1016/j.jclinepi.2013.02.003 [published Online First: 2013/04/11]
13. Hazlewood GS, Pardo JP, Barnabe C, et al. Canadian Rheumatology Association living guidelines for the pharmacological management of rheumatoid arthritis with disease-modifying anti-rheumatic drugs. *Journal of Rheumatology* 2022;15:15. doi: https://dx.doi.org/10.3899/jrheum.220209
14. Hazlewood GS, Pardo JP, Barnabe C, et al. Canadian Rheumatology Association living guidelines for the pharmacological management of rheumatoid arthritis with disease-modifying anti-rheumatic drugs 2022 [version 1.0] [Available from: https://app.magicapp.org/#/guideline/6511 accessed June 16, 2023 [version 1.0].
15. Australia & New Zealand Musculoskeletal Clinical Trials Network (ANZMUSC). An Australian Living Guideline for the Pharmacological Management of Inflammatory Arthritis 2023 [version 2.14] [Available from: https://app.magicapp.org/#/guideline/LqRV3n accessed June 16 2023 [version 2.14].
16. Buchbinder R, Glennon V, Johnston RV, et al. Australian recommendations on perioperative use of disease-modifying anti-rheumatic drugs in people with inflammatory arthritis undergoing elective surgery. *Intern Med J* 2023 doi: 10.1111/imj.16073 [published Online First: 2023/04/18]
17. Whittle SL, Glennon V, Johnston RV, et al. Australian recommendations on tapering of biologic and targeted synthetic disease-modifying anti-rheumatic drugs in inflammatory arthritis. *Intern Med J* 2022;52(10):1799-805. doi: 10.1111/imj.15816 [published Online First: 2022/05/15]
18. El Mikati IK, Khabsa J, Harb T, et al. A Framework for the Development of Living Practice Guidelines in Health Care. *Ann Intern Med* 2022;175(8):1154-60. doi: 10.7326/M22-0514 [published Online First: 2022/07/06]
19. Hazlewood GS, Whittle SL, Kamso MM, et al. Disease-modifying anti-rheumatic drugs for rheumatoid arthritis: a systematic review and network meta-analysis. *Cochrane Database of Systematic Reviews* 2020(3) doi: 10.1002/14651858.CD013562
20. Simons G, Caplan J, DiSantostefano RL, et al. Systematic review of quantitative preference studies of treatments for rheumatoid arthritis among patients and at-risk populations. *Arthritis Res Ther* 2022;24(1):55. doi: 10.1186/s13075-021-02707-4 [published Online First: 2022/02/24]
21. Durand C, Eldoma M, Marshall DA, et al. Patient Preferences for Disease-modifying Antirheumatic Drug Treatment in Rheumatoid Arthritis: A Systematic Review. *Journal of Rheumatology* 2020;47(2):176-87. doi: 10.3899/jrheum.181165
22. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;4(1):1. doi: 10.1186/2046-4053-4-1 [published Online First: 2015/01/03]
23. Purnell TS, Joy S, Little E, et al. Patient preferences for noninsulin diabetes medications: a systematic review. *Diabetes Care* 2014;37(7):2055-62. doi: 10.2337/dc13-2527 [published Online First: 2014/06/26]

24. Hazlewood GS. Measuring Patient Preferences: An Overview of Methods with a Focus on Discrete Choice Experiments. *Rheum Dis Clin North Am* 2018;44(2):337-47. doi: 10.1016/j.rdc.2018.01.009 [published Online First: 2018/04/07]
25. Selva A, Sola I, Zhang Y, et al. Development and use of a content search strategy for retrieving studies on patients' views and preferences. *Health Qual Life Outcomes* 2017;15(1):126. doi: 10.1186/s12955-017-0698-5 [published Online First: 2017/08/31]
26. Lee C, Thomas M, Ejaredar M, et al. Crowdsourcing trainees in a living systematic review provided valuable experiential learning opportunities: a mixed-methods study. *J Clin Epidemiol* 2022;147:142-50. doi: 10.1016/j.jclinepi.2022.03.019 [published Online First: 2022/04/02]
27. Pianarosa E, Hsiao R, Thomas M, et al. Supporting Equity Through Rheumatoid Arthritis Treatment Guidelines: The Development of Logic Models for Six Populations at Risk for Inequitable Outcomes in Canada. *Journal of Rheumatology* 2020;47(7):1083-84.
28. Barnabe C, Pianarosa E, Hazlewood G. Informing the GRADE evidence to decision process with health equity considerations: demonstration from the Canadian rheumatoid arthritis care context. *J Clin Epidemiol* 2021;138:147-55. doi: 10.1016/j.jclinepi.2021.06.013 [published Online First: 2021/06/24]
29. Thomas M, Barnabe C, Kleissen T, et al. Rheumatoid Arthritis Care Experiences of Black People Living in Canada: A Qualitative Study to Inform Health Service Improvements. *Arthritis Care Res (Hoboken)* 2023 doi: 10.1002/acr.25278 [published Online First: 2023/12/11]

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only

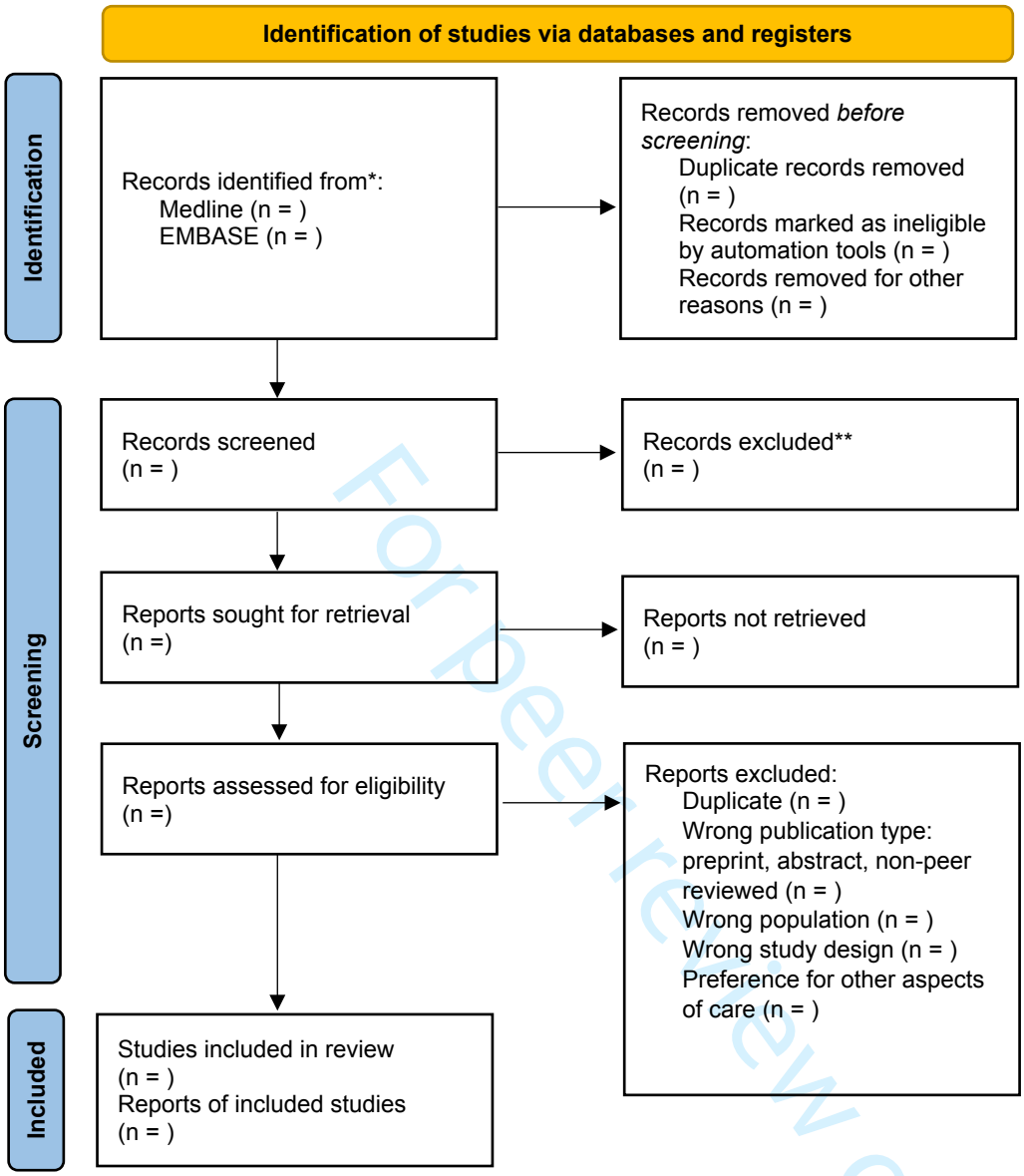

Figure 1. PRISMA flow diagram for the living systematic review of patient preference studies in inflammatory arthritis

Table of Contents

Appendix A. MEDLINE Search strategy (adapted from Selva et al, 2017)[1]

#	Query
1	exp arthritis, rheumatoid/
2	((rheumatoid or reumatoid or revmatoid or rheumatic or reumatic or revmatic or rheumat* or reumat* or revmarthrit*) adj3 (arthrit* or artrit* or diseas* or condition* or nodule*)).tw.
3	1 or 2
4	exp Arthritis, Juvenile Rheumatoid/
5	JIA.tw
6	(juvenile adj2 arthritis).tw.
7	or/4-6
8	enthesitis.tw.
9	Arthritis, Psoriatic/
10	oligoarthritis.tw.
11	or/8-10
12	(child* or adolescent* or infan*).tw.
13	11 and 12
14	limit 11 to (infant or child or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>)
15	13 or 14
16	Spondylarthritis/
17	spondylarthritis.ti,ab.
18	spondyloarthritis.ti,ab.
19	Spondylarthropathies/
20	spondylarthropath$.ti,ab.
21	spondyloarthropath$.ti,ab.
22	Spondylitis/
23	Spondylitis, Ankylosing/
24	ankylosing spondylitis.ti,ab.
25	spondylitis.ti,ab.
26	((axial adj (SpA or disease or arthritis)) or axial joint disease).ti,ab.
27	enthesitis.ti,ab.
28	sacroiliitis/ or (sacroiliitis or sacroilitis).ti,ab.
29	(peripheral adj2 arthritis).ti,ab.
30	Or/16-29
31	Arthritis, Psoriatic/
32	(psoria$ adj (arthriti$ or arthropath$)).tw.
33	((arthriti$ or arthropath$) adj psoria$).tw.
34	Or/29-31
35	3 or 15 or 34
36	qualitative stud*.tw.

[1] Selva A, Sola I, Zhang Y, et al. Development and use of a content search strategy for retrieving studies on patients' views and preferences. Health Qual Life Outcomes 2017;15:126.

37 exp Qualitative Research/
38 survey*.tw.
39 exp Data Collection/
40 questionnaire*.tw.
41 focus group*.tw.
42 conjoint analysis.tw.
43 discrete choice experiment*.tw.
44 rating task*.tw.
45 ranking task*.tw.
46 choice experiment*.tw.
47 decision aid*.tw.
48 risk attitude*.tw.
49 risk aversion.tw.
50 discrete choice*.tw.
51 standard gamble.tw.
52 willingness to pay.tw.
53 willingness-to-pay.tw.
54 decision support technique*.tw.
55 decision support system*.tw.
56 decision making.tw.
57 time trade*.tw.
58 exp Questionnaires/
59 trade off*.tw.
60 stated preference*.tw.
61 contingent valuation.tw.
62 choice experiment.tw.
63 best-worst scaling.tw.
64 Q-method*.tw
65 control preference* scale.tw.
66 self-explicated conjoint.tw.
67 Start* known efficac*.tw.
68 threshold technique.tw.
69 constant sum scal*.tw.
70 repertory grid method.tw.
71 exp Analytic Hierarchy Process/
72 swing weight*.tw.
73 visual analog* scale.tw.
74 allocat* of point*.tw.
75 outcome prioriti* tool.tw.
76 measure of value.tw.
77 preference trial.tw.
78 grounded theory/ or qualitative research/
79 (qualitative* or focus group* or interview* or mixed method* or mixed-method* or content analysis or thematic analysis or phenomenological study or ethnograph* or interpretive description or narrative* or semi-structured or unstructured or face-to-face or constant comparative or participant observation or audio recorded).mp.

80	px.fs
81	or/36-80
82	exp Consumer Satisfaction/
83	exp Consumer Participation/
84	exp Patient Satisfaction/
85	patient perspective*.tw.
86	exp "Attitude of Health Personnel"/
87	exp Health Knowledge, Attitudes, Practice/
88	exp "Delivery of Health Care"/
89	patient compliance.tw.
90	patient participation.tw.
91	patient satisfaction.tw.
92	treatment refusal.tw.
93	patient preference*.tw.
94	patient opinion*.tw.
95	patient belief*.tw.
96	patient concern*.tw.
97	patient perspective*.tw.
98	patient choice*.tw.
99	patient value*.tw.
100	patient priorit*.tw.
101	exp Health Priorities/
102	patient perception*.tw.
103	choice behavio*.tw.
104	patient consensus.tw.
105	exp Consensus/
106	(dissent and dispute*).tw.
107	uncertaint*.tw.
108	(utility or utilities).ti,ab.
109	discrete choice*.tw.
110	((patient$ or participant$) adj3 (participation or satisfaction or perspective$ or compliance or preference$ or opinion$ or belief$ or concern$ or choice$ or value$ or priorit$ or perception$ or request$)).tw.
111	or/82-110
112	35 and 81 and 111
113	exp animals/ not humans.sh.
114	112 not 113

Appendix B. List of variables to be extracted

Variable	Explanation	Response format	Notes	Examples
Study characteristics				
Method	How were the preferences elicited	Free text	Use terminology from Table 1 where possible. Include all methods if more than one used.	-Discrete choice experiment -Standard gamble; simple direct weighting (visual analogue scale)
Attribute selection process	How were the attributes selected	Free text		-Qualitative study -Chosen by experts
Treatments of interest	Which treatments were the focus of the study	Free text		-csDMARDs, bDMARDs, tofacitinib -corticosteroids
Country(s)	Which country(s) was the study conducted in	Free text	If > 5 countries, summarize according to continent or geographic region. List countries alphabetically.	-Finland; Sweden
Setting	Clinic setting or sampling framework	Free text	Describe where patients in the study were sampled from	-Outpatient clinics at one academic centre -Outpatient clinics at academic and community centres -Patient registry -Online panel
Recruitment procedure	How were people recruited	Free text	Describe the method of recruitment	-In person clinic recruitment -E-mail to patients in an existing registry -Link to the study shared through patient groups
Eligibility criteria	Eligibility criteria for	Free text	Copy verbatim from the study	

	the study		description	
Patient Population	Health conditions of the population studied	Free text	Include the percentages if a mixed population	RA (43%), PsA (30%), Ankylosing spondylitis (25%)
Sample size	Number of people who completed the survey or study	Numeric	If some participants had missing data and this is reported, record the number of people who completed the preference-elicitation aspect of the study	
Response rate (offered)	Percentage of people who were offered the study that completed it	Numeric	In a study where people were recruited in clinic or through a registry, this would be the number approached (for example, either in person or through e-mail) who completed the study. In a study where a link to the study was posted on a patient website, it would not be possible to estimate this number.	
Response rate (consented/viewed)	Percentage of people who consented or viewed the study that completed it	Numeric	Percentage of people who consented to the study, or who started the study (for example, in the case of an e-mailed link) and completed it.	
Funding	Funding received for the study	Free text	List the funding agency or company name	-Public (funding agency) -Industry (company name) -Public and industry (company name)
Industry affiliations of authors	Are authors employees or affiliated with a pharmaceutical	Free text	Yes/no, then list affiliation(s)	-No -Yes (company name)

	company			
Statistical analysis	Statistical method used to analyse data	Free text	List the method as stated in the text	-Mixed-logit model -Hierarchical bayesian
Patient characteristics				
Age	Mean or median age of study participants	Numeric	If both mean and median reported, record mean unless sample skewed	
Sex/Gender	The sex and/or gender of the participants.	Free text with percentage values	Record as recorded/ reported by the study. Include all gender categories that were response options, if available. If both sex and gender reported, describe both.	-Female (89%), male (11%), non-binary (0.2%), prefer not to answer (0.5%)
Disease duration (years)	How many years have the people in the study had their disease	Numeric	Record as reported by the study. In mixed populations, record for each disease, if available	-10.7 -5.5 (RA); 6.3 (PsA)
Disease severity	Measures of disease severity, relevant to the population studied	Free text	Any validated measure of disease severity e.g., DAS28, CDAI, BASDAI. Extract all that are available.	
Physical function	Measures of functional status	Free text	Any validated measure of disease severity e.g., HAQ-DI, PROMIS Physical Function	
Ethnicity	Ethnicity of study participants	Free text with percentage values	Record as reported by the study	-Caucasian (55%); Black (20%); Hispanic (10%); other (15%)
Education	Education level of study participants	Free text with percentage values	Record as reported by the study	-Greater than high-school (55%)
Place of residence	Any details on the	Free text	Only record if directly reported	-Urban (75%); rural (25%)

of participants	location of participants (e.g., urban/rural)	with percentage values	by the study i.e., do not assume that if the study is conducted at an academic centre, the participants are urban.	-Immigrant/ refugee/ vulnerably housed.
Health literacy	Any measure of the health literacy of participants	Free text	Record as reported by the study. Some tools for measuring are here.	
Additional patient characteristics relevant for the study	Any additional characteristics relevant to the study	Free text	For example, a study may have a particular focus on a subgroup of patients and could report those characteristics here if not otherwise captured above.	

BMJ Open

Patient preferences for drug therapy in inflammatory arthritis: protocol for a living systematic review and evidence map to inform clinical practice guidelines

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2024-088267.R1
Article Type:	Protocol
Date Submitted by the Author:	26-Nov-2024

Complete List of Authors:	Saadat, Pakeezah; University of Toronto, Institute of Health Policy, Management, and Evaluation Bansback, Nick; The University of British Columbia, School of Population and Public Health; Arthritis Research Canada Falahee, Marie; University of Birmingham, Rheumatology Research Group, Institute of Inflammation and Ageing, College of Medical and Dental Sciences; University Hospitals Birmingham NHS Foundation Trust, NIHR Birmingham Biomedical Research Centre Hiligsmann , Mickaël ; Maastricht University, Department of Health Services Research, CAPHRI Care and Public Health research Institute Tugwell, Peter; University of Ottawa Faculty of Medicine, Department of Medicine; Ottawa Hospital Research Institute Clinical Epidemiology Program Buchbinder, Rachelle; Monash University, Musculoskeletal Health and Wiser Health Care Units, School of Public Health and Preventive Medicine Whittle, Samuel; Monash University, School of Public Health and Preventive Medicine; Queen Elizabeth Hospital, Rheumatology Unit Richards, Dawn P.; Canadian Arthritis Patient Alliance Proulx, Laurie ; Canadian Arthritis Patient Alliance Schunemann, Holger; McMaster University, Department of Health Research Methods, Evidence and Impact; McMaster University, Department of Medicine; Humanitas University, Department of Biomedical Sciences Alonso-Coello, Pablo; Instituto de Investigacion Biomedica, Centro GRADE Barcelona Nieuwlaat, Robby; McMaster University, Department of Medicine; McMaster University, Michael G. DeGroote Cochrane Canada & McMaster GRADE Centres; McMaster University, World Health Organization Collaborating Center for Infectious Diseases, Research Methods and Recommendations Wiercioch, Wojtek; McMaster University, Department of Medicine; McMaster University, Michael G. DeGroote Cochrane Canada & McMaster GRADE Centres; McMaster University, World Health Organization Collaborating Center for Infectious Diseases, Research Methods and Recommendations Kuper, Simon; Maastricht University, Faculty of Health, Medicine and Life Sciences Pardo Pardo, Jordi; University of Ottawa, Cochrane Musculoskeletal, Faculty of Medicine

	Hazlewood, Glen; University of Calgary Cumming School of Medicine, Departments of Medicine and Community Health Sciences; University of Calgary Cumming School of Medicine, McCaig Institute for Bone and Joint Health; Arthritis Research Canada
Primary Subject Heading:	Rheumatology
Secondary Subject Heading:	Health services research, Patient-centred medicine
Keywords:	Patients, RHEUMATOLOGY, Systematic Review

Patient preferences for drug therapy in inflammatory arthritis: protocol for a living systematic review and evidence map to inform clinical practice guidelines

Pakeezah Saadat,[1] pakeezah.saadat@mail.utoronto.ca
Nick Bansback,[2] nick.bansback@ubc.ca
Marie Falahee,[3] m.falahee@bham.ac.uk
Mickael Hiligsmann,[4] m.hiligsmann@maastrichtuniversity.nl
Peter Tugwell,[5] ptugwell@uottawa.ca
Rachelle Buchbinder,[6] rachelle.buchbinder@monash.edu
Samuel Whittle,[7] samuelwhittle@gmail.com
Dawn P Richards,[8] dawn.p.richards@gmail.com
Laurie Proulx,[8] laurieproulx@bell.net
Holger Schunemann,[9,10] holger.schunemann@mcmaster.ca
Pablo Alonso Coello,[11] palonso@santpau.cat
Robby Nieuwlaat,[10,12] nieuwlr@mcmaster.ca
Wojtek Wiercioch,[10,12] wierciww@mcmaster.ca
Simon Kuper,[13] simon.kuper97@gmail.com
Jordi Pardo Pardo,[14] jpardo@uottawa.ca
Glen S Hazlewood[15] gshazlew@ucalgary.ca

[1]Institute of Health Policy, Management, and Evaluation, University of Toronto, Toronto, ON, Canada
[2]School of Population and Public Health, University of British Columbia, BC, Canada; Arthritis Research Canada, Richmond, BC, Canada
[3]Rheumatology Research Group, Institute of Inflammation and Ageing, College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK; NIHR Birmingham Biomedical Research Centre, University Hospitals Birmingham NHS Foundation Trust and University of Birmingham, Birmingham, UK
[4]Department of Health Services Research, CAPHRI Care and Public Health research Institute, Maastricht University, Netherlands
[5]Department of Medicine, University of Ottawa Faculty of Medicine, Ottawa, ON, Canada; Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, ON, Canada
[6]Musculoskeletal Health and Wiser Health Care Units, School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia
[7]School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia; Rheumatology Unit, Queen Elizabeth Hospital, Adelaide, Australia
[8]Canadian Arthritis Patient Alliance, Toronto, ON, Canada
[9]Department of Health Research Methods, Evidence and Impact, McMaster University, Health Sciences Centre, Hamilton, ON, Canada
[10]Department of Medicine, McMaster University, Health Sciences Centre, Hamilton, ON L8S 4K1, Canada; Department of Biomedical Sciences, Humanitas University, Milano, Italy
[11]Centro GRADE Barcelona, Instituto de Investigacion Biomedica (IIB Sant Pau), Barcelona, Spain
[12]World Health Organization Collaborating Center for Infectious Diseases, Research Methods and Recommendations, Michael G. DeGroote Cochrane Canada & McMaster GRADE Centres; McMaster University, Hamilton, ON, Canada
[13] Faculty of Health, Medicine and Life Sciences, Maastricht University, Germany
[14]Cochrane Musculoskeletal, Faculty of Medicine, University of Ottawa, Ottawa, Ontario, Canada

[15]Departments of Medicine and Community Health Sciences, Cumming School of Medicine, University of Calgary, Calgary, AB, Canada; Arthritis Research Canada, Richmond, BC, Canada; McCaig Institute for Bone and Joint Health, Calgary, Canada

Correspondence to:

Glen S Hazlewood

3280 Hospital Dr NW, 3AA10 HRIC, Calgary, AB T2N4Z6, Canada

gshazlew@ucalgary.ca

Word count: 2237

ABSTRACT

Introduction: The pharmacological management of inflammatory arthritis often requires choices that involve trade-offs between benefits, risks, and other attributes such as administration route, frequency and cost. This living systematic review aims to inform international clinical guidelines on inflammatory arthritis by creating an evidence map of patient preference studies concerning the trade-offs in pharmacological management of inflammatory arthritis.

Methods and analysis: We will include published and peer-reviewed full-text studies in any language that quantitatively assess preferences of patients for the pharmacological management of inflammatory arthritis (rheumatoid arthritis, spondyloarthritis and juvenile idiopathic arthritis). Studies must use either stated or revealed preference methods to assess preferences and provide a quantitative assessment of relevant characteristics, such as benefits, risks, costs, and process attributes. Articles will identified through Medline and EMBASE database searches from inception using search terms that combine keywords and subject headings for inflammatory arthritis and preference-based methods, and a search in the Health Preference Study and Technology Registry using keywords for the populations of interest. Two independent reviewers will perform abstract and full-text screening. Risk of bias will be assessed using the GRADE risk of bias tool. An evidence map will be generated to summarize included studies and their assessments of each trade-off. The search will be conducted every 6 months with new studies added to the inventory.

Ethics and dissemination: Ethics approval is not required. Results from the base review will be published in a peer-reviewed journal and findings will be presented at conferences. In the living

model, we will publish updates and datasets on an Open Science Framework page, with periodic updates in peer-reviewed journals.

Keywords: inflammatory arthritis, patient preference, trade-off, living systematic review

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This living systematic review of patient preference studies will inform international clinical guidelines for inflammatory arthritis.
- Biannual updates will be conducted to promptly integrate emerging evidence, facilitating the maintenance of up-to-date clinical guidelines for inflammatory arthritis.
- Since the field is still evolving, the search strategy and data presentation will be adapted to incorporate newly emerging evidence.
- We will not meta-analyze the relative importance of each attribute as quantitative synthesis poses a challenge due to significant heterogeneity in study designs and attributes.

INTRODUCTION

Treatment choices in inflammatory arthritis nearly always involve trade-offs. People living with inflammatory arthritis need to choose between treatments that can differ in their benefits, risks, and other characteristics such as route of administration, frequency, and cost. For example, in rheumatoid arthritis, “triple therapy” with methotrexate, sulfasalazine and hydroxychloroquine has additional burden in terms of more pills, potentially more adverse effects, but an improved chance of a treatment response over methotrexate alone [1 2]. Tofacitinib, a Janus Kinase (JAK) inhibitor, has been shown to have a higher risk of cardiovascular adverse events and certain malignancies in people at risk for cardiovascular events [3], but is available as a pill and is an effective option for many patients. For people with psoriatic arthritis, certain treatments may work better for different disease manifestations, such as skin disease or enthesitis, and this needs to be balanced against the control of their joint disease [4 5]. Corticosteroids offer rapid improvement for many patients with inflammatory arthritis, but long-term use is associated with multiple risks [6]. Understanding patient preferences for these trade-offs is important to guide patient-centered care.

Patient preferences can be assessed or measured in multiple ways. Qualitative approaches can help understand how patients approach the decision-making process and the relevant considerations for a given healthcare decision [7]. Quantitative approaches provide numerical estimates of patient preferences for different treatments or treatment attributes, including risks and benefits and other considerations, such as route of administration or cost [8 9]. Quantitative methods can be categorized into revealed preference methods that measure

which treatment people choose when presented with an actual choice, or stated preference methods that ask patients to rate, rank, or choose between hypothetical treatment options or attributes. Stated preference methods can be further categorized according to different frameworks [8 10]. Revealed preference methods, where actual choices of participants are recorded are challenging, as real-world choices are often influenced by the healthcare providers' recommendations or restrictions imposed by insurance plans. Hence, most studies use stated preference methods.

When developing clinical practice guidelines, it is important to understand patient preferences for the relevant trade-offs. Under the GRADE approach, patient values and preferences are a key consideration in the Evidence to Decision framework, when deciding on the direction and strength of a recommendation [11]. While not often done, a systematic review of patient preference studies is recommended to inform these judgements [12]. Quantitative estimates of patient preferences are desired, as guideline panels need to consider which outcomes or other attributes are most important and by how much. When a guideline panel is confident that based on the balance of benefits and harms nearly all patients would choose a particular course of action then a strong recommendation can be made. Otherwise, a conditional recommendation is made, either for or against the treatment.

We have recently started living clinical guidelines for inflammatory arthritis in both Canada [13 14] and Australia [15-17]. In a living clinical practice guideline, treatment recommendations are kept up to date as new evidence emerges[18]. Within an entire guideline, individual recommendations

may remain stable, while others may be updated in a living mode through living systematic reviews of the risks and benefits, which we have initiated for inflammatory arthritis [19]. Each time a recommendation is added, or new evidence emerges, guideline panels need to either make or update their judgements regarding the balance of risks and benefits. In a living model, this requires regular updates of the evidence on patient preferences. New preference studies may have been published, and treatments may have new attributes, such as newly discovered risks. For example, in our inflammatory arthritis guidelines, our recommendation for choices of treatment after an inadequate response to anti-TNF therapy [14 15] required an update to our prior systematic review on patient preferences [20 21], given the risks of malignancy and cardiovascular events with JAK inhibitors. We did not find any studies that measured preferences for these trade-offs, but this evidence will likely emerge over time.

The aim of this systematic review will be to develop a living evidence map of patient preference studies as they relate to the treatment of inflammatory arthritis. By “evidence map” we mean a catalogue of studies that are characterized in terms of their characteristics and methods used, risk of bias, and which outcomes or other treatment attributes they included. We do not intend to summarize or meta-analyze the relative importance of each attribute, which is often challenging due to study heterogeneity. Rather, the intention is that guideline developers can use the evidence map to identify and review the studies relevant to their context to help inform clinical guideline recommendations.

METHODS AND ANALYSIS

This protocol adheres to the PRISMA-P checklist,[22] which is available in the supplementary material.

Eligibility criteria

Population

We will include any study that provides a quantitative assessment of patients' preferences for the management of inflammatory arthritis. Inflammatory arthritis includes rheumatoid arthritis, juvenile idiopathic arthritis, and spondyloarthritis, as defined by the study authors. Spondyloarthritis includes psoriatic arthritis, ankylosing spondylitis, reactive arthritis, enteropathic arthritis, and axial and/or peripheral spondyloarthritis not otherwise classified. We will include studies that have at least 75% of the included participants with inflammatory arthritis.

Outcomes

To be included, a study must include a quantitative assessment of the importance of attributes relevant to the pharmacologic and non-pharmacologic management of inflammatory arthritis. This includes treatment benefits, risks, and process attributes. Process attributes include any aspect related to care delivery, such as route and frequency of administration, access to care, and costs. Preferences may be assessed for attributes separately, or together, as would be the case when presenting patients with a 'real-world' choice between treatment options that differ across multiple characteristics (i.e., in revealed preference studies). We will exclude studies that exclusively provide an estimate of patients' health-related quality of life (HRQOL). HRQOL measures the value a patient places on their current health state and not their preference for potential treatment outcomes or attributes [23 24].

Study design

We will include any published and peer-reviewed full-text study in any language that assessed preferences using stated-preference methods [10] (where participants are asked their preferences for hypothetical choices) or revealed-preference methods (where the actual choices of patients are observed after being presented with a decision-aid) [8]. We will exclude abstracts, pre-print articles and studies that have not been peer-reviewed. The stated-preference methods categorized by Soekhai et al. [10] consist of four distinct categories (**Table 1**). Discrete-choice experiments examine trade-offs between attributes and their alternatives given a series of choice sets. Ranking methods are used to elicit an order of attributes and their alternatives through ranking exercises, such as best-worst scaling. Indifference methods ask people to make a choice between staying in a given health state for the rest of their life versus a return to full health with a shortened life expectancy (time trade-off) or a gamble with a chance of returning to full health but also a chance of immediate death (standard gamble). The thresholds (life expectancy or chance of death) are manipulated until the point of indifference is found. Rating methods ask people to choose the strength of their preference using a labeled scale.

Table 1. Inventory of patient-preference methods, adapted from Soekhai et al [10]

Category	Method
Discrete-choice-based methods	Discrete choice experiment/Best-worst scaling (type 3)
	Adaptive conjoint analysis
Ranking methods	Qualitative discriminant process
	Q-methodology
	Control preferences scale
	Best-worst scaling (type 1 & 2)
	Self-explicated conjoint
Indifference methods	Standard gamble
	Time trade-off
	Person trade-off
	Starting known efficacy
	Test trade-off
	(Probabilistic) threshold technique
	Contingent valuation
Rating methods	Constant sum scaling
	Repertory grid method
	Analytic hierarchy process
	Swing weighting
	Visual analog scale
	Allocation of points
	Outcome prioritization tool
	Measure of value
Revealed preferences	Patient preference trials
	Direct questions in clinical trials

Living review considerations: If new preference-based approaches are identified or developed over time, these will be added to the eligibility criteria. Our search (described below) is also designed to identify qualitative studies, which would allow us to expand the scope of work in the future.

Information sources and search strategy

We will search the following databases from inception: Medline In Process and Other Non-indexed Citations, and EMBASE (Excerta Medica Database). The search strategy is presented in **Appendix A** and combines keywords and subject headings for inflammatory arthritis and preference-based methods. The MEDLINE and EMBASE inflammatory arthritis filters were derived from Cochrane reviews and adapted for the other databases. The preference-based method filter was derived from Selva et al [25] and supplemented with additional filters to capture all methods in Table 1, as well as qualitative studies. Additionally, we will search the Health Preference Study and Technology Registry (HPSTR; https://hpstr.org/), a web-based registry of health preference studies and technologies, using keywords for each population of interest (defined above).

Living review considerations: The search filters will be reviewed periodically and updated as needed, particularly if new validated filters for preference studies are published that suit our purpose. For the base review, the search will be conducted once, then updated prior to publication, after which the review will transition to a living mode. In the living mode, the search will be updated every 6 months, with the frequency adjusted as needed based on the usefulness and feasibility.

Article screening

The titles and abstracts of all records will first be screened for eligibility independently by two reviewers. Any record that either reviewer marks as unclear or included will proceed to full-text review. Full-text review will also be done by pairs of reviewers working independently. Any disagreement at the full-text stage will be discussed between reviewers and with senior reviewer(s) as necessary. At the full-text stage, articles will be excluded in the following

hierarchy: wrong publication type (e.g. pre-print, abstract); wrong population; wrong study design (not a preference-elicitation method); preferences for other aspects of care (e.g., diagnostic approaches). Articles in a different language will be translated into English. An example PRISMA flow-chart is presented in **Figure 1**.

Living review considerations: We will explore the incorporation of technologies to improve the efficiency of the article screening process, including automation, machine learning and crowd sourcing. We have employed these tools in other reviews of interventions [19 26], but to our knowledge they have not yet been developed for patient preference literature. It is our hope that the results of our review could be used to develop automated approaches for the screening of records. We will flag potentially eligible qualitative studies in the correct population, which would allow us to expand the scope of work in the future without having to rescreen all records.

Data extraction

Study data will be extracted independently by two team members. From each study we will extract relevant study and participant characteristics as listed in **Appendix B** if reported. Study characteristics include details on the population of interest, setting, response rate, recruitment strategy, funding, statistical analysis used, attribute selection process, and preference-elicitation methods. Participant characteristics include age, sex/gender, disease duration and severity, health literacy and sociodemographic characteristics, particularly those that would identify patient populations at risk for inequities in care. In prior studies, we have identified the following seven priority populations for guidelines in rheumatoid arthritis [27 28]: rural and remote residents, Indigenous Peoples, elderly persons with frailty, first-generation immigrants and

refugees, persons of low socioeconomic status or who are vulnerably housed, sex and gender diverse populations, and Black Canadians (added since our original framework[29]).

For each study, we will extract the attributes and levels evaluated, including a short description and the actual description presented in the survey to participants. The results of the study will be extracted as the estimated value for each attribute value, including the point estimate (mean/median), scale, and measure of variability. If this data is not presented it will calculate from the available data, if possible. Otherwise, we will extract the data as reported by the study (e.g. relative importance, ranks of attribute importance). We will extract measures of variability in the following order depending on availability: standard deviations (SDs), standard errors (SEs), 95% confidence intervals (Cis) or credible intervals (CrI), and exact *P*-values with the statistical test used. Data screening and extraction will be done via Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia, available at www.covidence.org).

Living review considerations: Depending on the volume of studies identified, the timing of data extraction for each study may need to be staged, prioritizing those studies that are most relevant to inform our living guidelines. We will include a table of studies pending data extraction and risk of bias assessment in the review.

Risk of bias

The risk of bias in each study will be assessed using the GRADE risk of bias tool for value and preference studies, which has been developed and validated, and is being finalized for publication. Assessment will be done independently by two team members and any discrepancies will be resolved through consensus.

Living review considerations: If preferred risk of bias tools change over time, these will be incorporated in the review.

Data presentation

Study characteristics will be summarized descriptively in a table. An evidence map will be generated that summarizes the current literature in terms of which available studies assess each trade-off. An example is included in **Table 2**. The rows and columns will contain all attributes assessed. Attributes will be grouped into categories by two independent reviewers with help from a senior reviewer, if needed. Each cell will list the study(s) that included those attributes. Studies that include absolute anchors of attribute importance (e.g. measured on a 0-1 scale, where 0 represents death and 1 represents full health), such as a standard gamble, time trade-off or visual analogue scales, will be included in the bottom row. This would allow guideline panels to easily identify potential studies that would be relevant for their purpose and help identify gaps in the evidence.

Living review considerations: We will explore the value of including additional information within each cell of the evidence map (e.g., sample size and risk of bias), and alternative ways of summarizing the data to guideline panels, including interactive evidence maps that would provide more flexibility.

Table 2. Example of the evidence map displaying studies that have included each pair of attributes

		Benefits		Risks		Process	
		Remission	Pain reduction	GI side effects	Serious side effects	Route of delivery	Cost
Benefits	Remission	-	-	-	-	-	
	Pain reduction	[Study IDs]	-	-	-	-	
Risks	GI side effects	[Study IDs]	[Study IDs]	-	-	-	
	Serious side effects	[Study IDs]	[Study IDs]	[Study IDs]	-	-	
Process	Route of delivery	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	
	Cost	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	
	Absolute anchor of importance	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]	[Study IDs]

Patient and public involvement

This protocol was reviewed and refined with feedback from our patient partners, Dawn P Richards and Laurie Proulx, who are individuals living with rheumatoid arthritis/juvenile idiopathic arthritis.

ETHICS AND DISSEMINATION

Ethics approval is not required. Results from the base review will be published in a peer-reviewed journal and findings will be presented at conferences. In the living model, we will publish updates and datasets on an Open Science Framework page, with periodic updates in peer-reviewed journals.

Contributors

GSH is the guarantor. GSH conceptualized the study, and designed and reviewed the protocol with PS. PS and GSH drafted the study, defined the concepts, search strategy, data extraction process, methodological appraisal, and statistical analysis of the included studies. NB, MF, MH, PT, RB, SW, DPR, LP, HS, PAC, RB, WW, SK, and JPP provided critical insights. All authors have approved and contributed to the final written manuscript.

Funding

This protocol received no specific grant from any funding agency in the public, commercial or not-for-profit sectors. RB is supported by an Australian National Health and Medical Research Council (NHMRC) Investigator Fellowship (APP1194483). SW is supported by an Australia and New Zealand Musculoskeletal (ANZMUSC) Clinical Trial Network Practitioner Fellowship and by a grant from The Hospital Research Foundation Group.

Competing interests

All authors declare no competing interests.

REFERENCES

1. Hazlewood GS, Barnabe C, Tomlinson G, et al. Methotrexate monotherapy and methotrexate combination therapy with traditional and biologic disease modifying antirheumatic drugs for rheumatoid arthritis: abridged Cochrane systematic review and network meta-analysis. *BMJ* 2016;353:i1777. doi: 10.1136/bmj.i1777 [published Online First: 2016/04/23]
2. Hazlewood GS, Barnabe C, Tomlinson G, et al. Methotrexate monotherapy and methotrexate combination therapy with traditional and biologic disease modifying anti-rheumatic drugs for rheumatoid arthritis: A network meta-analysis. *Cochrane Database Syst Rev* 2016(8):CD010227. doi: 10.1002/14651858.CD010227.pub2 [published Online First: 2016/08/30]
3. Ytterberg SR, Bhatt DL, Mikuls TR, et al. Cardiovascular and Cancer Risk with Tofacitinib in Rheumatoid Arthritis. *N Engl J Med* 2022;386(4):316-26. doi: 10.1056/NEJMoa2109927 [published Online First: 2022/01/27]
4. Coates LC, Soriano ER, Corp N, et al. Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA): updated treatment recommendations for psoriatic arthritis 2021. *Nat Rev Rheumatol* 2022;18(8):465-79. doi: 10.1038/s41584-022-00798-0 [published Online First: 2022/06/28]
5. Singh JA, Guyatt G, Ogdie A, et al. Special Article: 2018 American College of Rheumatology/National Psoriasis Foundation Guideline for the Treatment of Psoriatic Arthritis. *Arthritis Rheumatol* 2019;71(1):5-32. doi: 10.1002/art.40726 [published Online First: 2018/12/01]
6. Rice JB, White AG, Scarpati LM, et al. Long-term Systemic Corticosteroid Exposure: A Systematic Literature Review. *Clin Ther* 2017;39(11):2216-29. doi: 10.1016/j.clinthera.2017.09.011 [published Online First: 2017/10/23]
7. Gooberman-Hill R. Qualitative approaches to understanding patient preferences. *Patient* 2012;5(4):215-23. doi: 10.1007/BF03262494 [published Online First: 2012/09/26]
8. Medical device Innovation Consortium (MDIC). Medical device Innovation Consortium (MDIC) Patient Centered Benefit-Risk Project Report: A Framework for Incorporating Information on Patient Preferences Regarding Benefit and Risk into Regulatory Assessments of New Medical Technology 2015 [updated March 11, 2022. Available from: https://mdic.org/project/patient-centered-benefit-risk-pcbr/ accessed 5 Sept 2023.
9. Hazlewood GS. Measuring Patient Preferences: An Overview of Methods with a Focus on Discrete Choice Experiments. *Rheumatic Diseases Clinics of North America* 2018;44(2):337-47. doi: https://dx.doi.org/10.1016/j.rdc.2018.01.009
10. Soekhai V, Whichello C, Levitan B, et al. Methods for exploring and eliciting patient preferences in the medical product lifecycle: a literature review. *Drug Discov Today* 2019;24(7):1324-31. doi: 10.1016/j.drudis.2019.05.001 [published Online First: 2019/05/12]
11. Montori VM, Brito JP, Murad MH. The optimal practice of evidence-based medicine: incorporating patient preferences in practice guidelines. *JAMA* 2013;310(23):2503-4. doi: 10.1001/jama.2013.281422 [published Online First: 2013/10/30]

12. Andrews JC, Schunemann HJ, Oxman AD, et al. GRADE guidelines: 15. Going from evidence to recommendation-determinants of a recommendation's direction and strength. *J Clin Epidemiol* 2013;66(7):726-35. doi: 10.1016/j.jclinepi.2013.02.003 [published Online First: 2013/04/11]
13. Hazlewood GS, Pardo JP, Barnabe C, et al. Canadian Rheumatology Association living guidelines for the pharmacological management of rheumatoid arthritis with disease-modifying anti-rheumatic drugs. *Journal of Rheumatology* 2022;15:15. doi: https://dx.doi.org/10.3899/jrheum.220209
14. Hazlewood GS, Pardo JP, Barnabe C, et al. Canadian Rheumatology Association living guidelines for the pharmacological management of rheumatoid arthritis with disease-modifying anti-rheumatic drugs 2022 [version 1.0] [Available from: https://app.magicapp.org/#/guideline/7554 accessed May 31, 2024 [version 2.1].
15. Australia & New Zealand Musculoskeletal Clinical Trials Network (ANZMUSC). An Australian Living Guideline for the Pharmacological Management of Inflammatory Arthritis 2023 [version 2.14] [Available from: https://app.magicapp.org/#/guideline/LqRV3n accessed June 16 Version 2.14.
16. Buchbinder R, Glennon V, Johnston RV, et al. Australian recommendations on perioperative use of disease-modifying anti-rheumatic drugs in people with inflammatory arthritis undergoing elective surgery. *Intern Med J* 2023 doi: 10.1111/imj.16073 [published Online First: 2023/04/18]
17. Whittle SL, Glennon V, Johnston RV, et al. Australian recommendations on tapering of biologic and targeted synthetic disease-modifying anti-rheumatic drugs in inflammatory arthritis. *Intern Med J* 2022;52(10):1799-805. doi: 10.1111/imj.15816 [published Online First: 2022/05/15]
18. El Mikati IK, Khabsa J, Harb T, et al. A Framework for the Development of Living Practice Guidelines in Health Care. *Ann Intern Med* 2022;175(8):1154-60. doi: 10.7326/M22-0514 [published Online First: 2022/07/06]
19. Hazlewood GS, Whittle SL, Kamso MM, et al. Disease-modifying anti-rheumatic drugs for rheumatoid arthritis: a systematic review and network meta-analysis. *Cochrane Database of Systematic Reviews* 2020(3) doi: 10.1002/14651858.CD013562
20. Simons G, Caplan J, DiSantostefano RL, et al. Systematic review of quantitative preference studies of treatments for rheumatoid arthritis among patients and at-risk populations. *Arthritis Res Ther* 2022;24(1):55. doi: 10.1186/s13075-021-02707-4 [published Online First: 2022/02/24]
21. Durand C, Eldoma M, Marshall DA, et al. Patient Preferences for Disease-modifying Antirheumatic Drug Treatment in Rheumatoid Arthritis: A Systematic Review. *Journal of Rheumatology* 2020;47(2):176-87. doi: 10.3899/jrheum.181165
22. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;4(1):1. doi: 10.1186/2046-4053-4-1 [published Online First: 2015/01/03]
23. Purnell TS, Joy S, Little E, et al. Patient preferences for noninsulin diabetes medications: a systematic review. *Diabetes Care* 2014;37(7):2055-62. doi: 10.2337/dc13-2527 [published Online First: 2014/06/26]

24. Hazlewood GS. Measuring Patient Preferences: An Overview of Methods with a Focus on Discrete Choice Experiments. *Rheum Dis Clin North Am* 2018;44(2):337-47. doi: 10.1016/j.rdc.2018.01.009 [published Online First: 2018/04/07]
25. Selva A, Sola I, Zhang Y, et al. Development and use of a content search strategy for retrieving studies on patients' views and preferences. *Health Qual Life Outcomes* 2017;15(1):126. doi: 10.1186/s12955-017-0698-5 [published Online First: 2017/08/31]
26. Lee C, Thomas M, Ejaredar M, et al. Crowdsourcing trainees in a living systematic review provided valuable experiential learning opportunities: a mixed-methods study. *J Clin Epidemiol* 2022;147:142-50. doi: 10.1016/j.jclinepi.2022.03.019 [published Online First: 2022/04/02]
27. Pianarosa E, Hsiao R, Thomas M, et al. Supporting Equity Through Rheumatoid Arthritis Treatment Guidelines: The Development of Logic Models for Six Populations at Risk for Inequitable Outcomes in Canada. *Journal of Rheumatology* 2020;47(7):1083-84.
28. Barnabe C, Pianarosa E, Hazlewood G. Informing the GRADE evidence to decision process with health equity considerations: demonstration from the Canadian rheumatoid arthritis care context. *J Clin Epidemiol* 2021;138:147-55. doi: 10.1016/j.jclinepi.2021.06.013 [published Online First: 2021/06/24]
29. Thomas M, Barnabe C, Kleissen T, et al. Rheumatoid Arthritis Care Experiences of Black People Living in Canada: A Qualitative Study to Inform Health Service Improvements. *Arthritis Care Res (Hoboken)* 2023 doi: 10.1002/acr.25278 [published Online First: 2023/12/11]

FIGURE LEGENDS

Figure 1. PRISMA flow diagram for the living systematic review of patient preference studies in inflammatory arthritis

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only

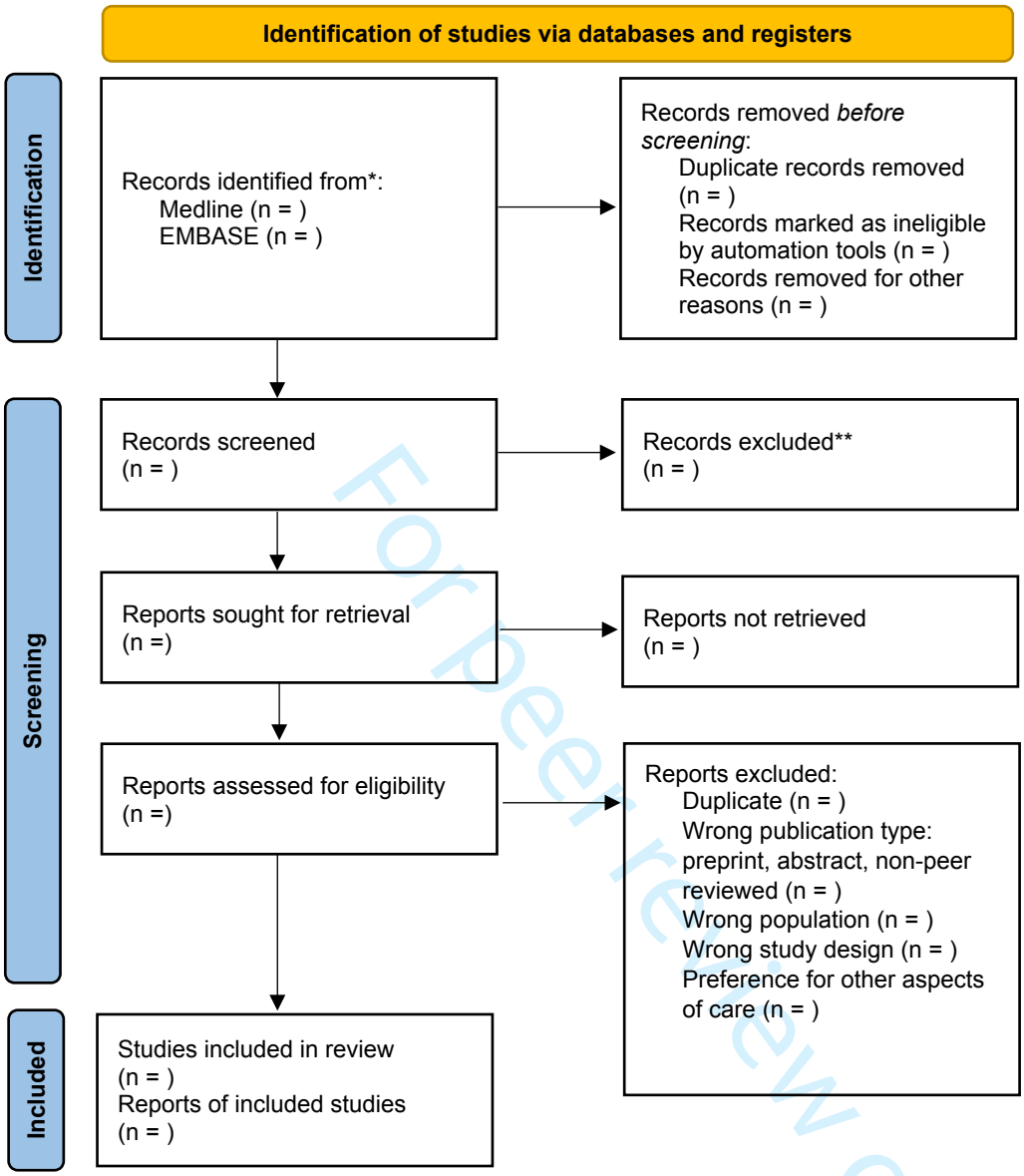

Figure 1. PRISMA flow diagram for the living systematic review of patient preference studies in inflammatory arthritis

Table of Contents

Appendix A. MEDLINE Search strategy (adapted from Selva et al, 2017)[1]

#	Query
1	exp arthritis, rheumatoid/
2	((rheumatoid or reumatoid or revmatoid or rheumatic or reumatic or revmatic or rheumat* or reumat* or revmarthrit*) adj3 (arthrit* or artrit* or diseas* or condition* or nodule*)).tw.
3	1 or 2
4	exp Arthritis, Juvenile Rheumatoid/
5	JIA.tw
6	(juvenile adj2 arthritis).tw.
7	or/4-6
8	enthesitis.tw.
9	Arthritis, Psoriatic/
10	oligoarthritis.tw.
11	or/8-10
12	(child* or adolescent* or infan*).tw.
13	11 and 12
14	limit 11 to (infant or child or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>)
15	13 or 14
16	Spondylarthritis/
17	spondylarthritis.ti,ab.
18	spondyloarthritis.ti,ab.
19	Spondylarthropathies/
20	spondylarthropath$.ti,ab.
21	spondyloarthropath$.ti,ab.
22	Spondylitis/
23	Spondylitis, Ankylosing/
24	ankylosing spondylitis.ti,ab.
25	spondylitis.ti,ab.
26	((axial adj (SpA or disease or arthritis)) or axial joint disease).ti,ab.
27	enthesitis.ti,ab.
28	sacroiliitis/ or (sacroiliitis or sacroilitis).ti,ab.
29	(peripheral adj2 arthritis).ti,ab.
30	Or/16-29
31	Arthritis, Psoriatic/
32	(psoria$ adj (arthriti$ or arthropath$)).tw.
33	((arthriti$ or arthropath$) adj psoria$).tw.
34	Or/29-31
35	3 or 15 or 34
36	qualitative stud*.tw.

[1] Selva A, Sola I, Zhang Y, et al. Development and use of a content search strategy for retrieving studies on patients' views and preferences. Health Qual Life Outcomes 2017;15:126.

exp Qualitative Research/
survey*.tw.
exp Data Collection/
questionnaire*.tw.
focus group*.tw.
conjoint analysis.tw.
discrete choice experiment*.tw.
rating task*.tw.
ranking task*.tw.
choice experiment*.tw.
decision aid*.tw.
risk attitude*.tw.
risk aversion.tw.
discrete choice*.tw.
standard gamble.tw.
willingness to pay.tw.
willingness-to-pay.tw.
decision support technique*.tw.
decision support system*.tw.
decision making.tw.
time trade*.tw.
exp Questionnaires/
trade off*.tw.
stated preference*.tw.
contingent valuation.tw.
choice experiment.tw.
best-worst scaling.tw.
Q-method*.tw
control preference* scale.tw.
self-explicated conjoint.tw.
Start* known efficac*.tw.
threshold technique.tw.
constant sum scal*.tw.
repertory grid method.tw.
exp Analytic Hierarchy Process/
swing weight*.tw.
visual analog* scale.tw.
allocat* of point*.tw.
outcome prioriti* tool.tw.
measure of value.tw.
preference trial.tw.
grounded theory/ or qualitative research/
(qualitative* or focus group* or interview* or mixed method* or mixed-method* or content analysis or thematic analysis or phenomenological study or ethnograph* or interpretive description or narrative* or semi-structured or unstructured or face-to-face or constant comparative or participant observation or audio recorded).mp.

80	px.fs
81	or/36-80
82	exp Consumer Satisfaction/
83	exp Consumer Participation/
84	exp Patient Satisfaction/
85	patient perspective*.tw.
86	exp "Attitude of Health Personnel"/
87	exp Health Knowledge, Attitudes, Practice/
88	exp "Delivery of Health Care"/
89	patient compliance.tw.
90	patient participation.tw.
91	patient satisfaction.tw.
92	treatment refusal.tw.
93	patient preference*.tw.
94	patient opinion*.tw.
95	patient belief*.tw.
96	patient concern*.tw.
97	patient perspective*.tw.
98	patient choice*.tw.
99	patient value*.tw.
100	patient priorit*.tw.
101	exp Health Priorities/
102	patient perception*.tw.
103	choice behavio*.tw.
104	patient consensus.tw.
105	exp Consensus/
106	(dissent and dispute*).tw.
107	uncertaint*.tw.
108	(utility or utilities).ti,ab.
109	discrete choice*.tw.
110	((patient$ or participant$) adj3 (participation or satisfaction or perspective$ or compliance or preference$ or opinion$ or belief$ or concern$ or choice$ or value$ or priorit$ or perception$ or request$)).tw.
111	or/82-110
112	35 and 81 and 111
113	exp animals/ not humans.sh.
114	112 not 113

Appendix B. List of variables to be extracted

Variable	Explanation	Response format	Notes	Examples
Study characteristics				
Method	How were the preferences elicited	Free text	Use terminology from Table 1 where possible. Include all methods if more than one used.	-Discrete choice experiment -Standard gamble; simple direct weighting (visual analogue scale)
Attribute selection process	How were the attributes selected	Free text		-Qualitative study -Chosen by experts
Treatments of interest	Which treatments were the focus of the study	Free text		-csDMARDs, bDMARDs, tofacitinib -corticosteroids
Country(s)	Which country(s) was the study conducted in	Free text	If > 5 countries, summarize according to continent or geographic region. List countries alphabetically.	-Finland; Sweden
Setting	Clinic setting or sampling framework	Free text	Describe where patients in the study were sampled from	-Outpatient clinics at one academic centre -Outpatient clinics at academic and community centres -Patient registry -Online panel
Recruitment procedure	How were people recruited	Free text	Describe the method of recruitment	-In person clinic recruitment -E-mail to patients in an existing registry -Link to the study shared through patient groups
Eligibility criteria	Eligibility criteria for	Free text	Copy verbatim from the study	

	the study		description	
Patient Population	Health conditions of the population studied	Free text	Include the percentages if a mixed population	RA (43%), PsA (30%), Ankylosing spondylitis (25%)
Sample size	Number of people who completed the survey or study	Numeric	If some participants had missing data and this is reported, record the number of people who completed the preference-elicitation aspect of the study	
Response rate (offered)	Percentage of people who were offered the study that completed it	Numeric	In a study where people were recruited in clinic or through a registry, this would be the number approached (for example, either in person or through e-mail) who completed the study. In a study where a link to the study was posted on a patient website, it would not be possible to estimate this number.	
Response rate (consented/viewed)	Percentage of people who consented or viewed the study that completed it	Numeric	Percentage of people who consented to the study, or who started the study (for example, in the case of an e-mailed link) and completed it.	
Funding	Funding received for the study	Free text	List the funding agency or company name	-Public (funding agency) -Industry (company name) -Public and industry (company name)
Industry affiliations of authors	Are authors employees or affiliated with a pharmaceutical	Free text	Yes/no, then list affiliation(s)	-No -Yes (company name)

	company			
Statistical analysis	Statistical method used to analyse data	Free text	List the method as stated in the text	-Mixed-logit model -Hierarchical bayesian
Patient characteristics				
Age	Mean or median age of study participants	Numeric	If both mean and median reported, record mean unless sample skewed	
Sex/Gender	The sex and/or gender of the participants.	Free text with percentage values	Record as recorded/ reported by the study. Include all gender categories that were response options, if available. If both sex and gender reported, describe both.	-Female (88%), male (11%), non-binary (0.2%), prefer not to answer (0.5%)
Disease duration (years)	How many years have the people in the study had their disease	Numeric	Record as reported by the study. In mixed populations, record for each disease, if available	-10.7 -5.5 (RA); 6.3 (PsA)
Disease severity	Measures of disease severity, relevant to the population studied	Free text	Any validated measure of disease severity e.g., DAS28, CDAI, BASDAI. Extract all that are available.	
Physical function	Measures of functional status	Free text	Any validated measure of disease severity e.g., HAQ-DI, PROMIS Physical Function	
Ethnicity	Ethnicity of study participants	Free text with percentage values	Record as reported by the study	-Caucasian (55%); Black (20%); Hispanic (10%); other (15%)
Education	Education level of study participants	Free text with percentage values	Record as reported by the study	-Greater than high-school (55%)
Place of residence	Any details on the	Free text	Only record if directly reported	-Urban (75%); rural (25%)

of participants	location of participants (e.g., urban/rural)	with percentage values	by the study i.e., do not assume that if the study is conducted at an academic centre, the participants are urban.	-Immigrant/ refugee/ vulnerably housed.
Health literacy	Any measure of the health literacy of participants	Free text	Record as reported by the study. Some tools for measuring are here.	
Additional patient characteristics relevant for the study	Any additional characteristics relevant to the study	Free text	For example, a study may have a particular focus on a subgroup of patients and could report those characteristics here if not otherwise captured above.	