









Implementation of recommendations in rheumatic and musculoskeletal diseases: considerations for development and uptake

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ABSTRACT

A clinical guideline is a document with the aim of guiding decisions based on evidence regarding diagnosis, management and treatment in specific areas of healthcare. Specific to rheumatic and musculoskeletal diseases (RMDs), adherence to clinical guidelines recommendations impacts the outcomes of people with these diseases. However, currently, the implementation of recommendations is less than optimal in rheumatology.

The WHO has described the implementation of evidence-based recommendations as one of the greatest challenges facing the global health community and has identified the importance of scaling up these recommendations. But closing the evidence-to-practice gap is often complex, time-consuming and difficult. In this context, the implementation science offers a framework to overcome this scenario.

This article describes the principles of implementation science to facilitate and optimise the implementation of clinical recommendations in RMDs. Embedding implementation science methods and techniques into recommendation development and daily practice can help maximise the likelihood that implementation is successful in improving the quality of healthcare and healthcare services.

INTRODUCTION

The dissemination of evidence-based recommendations is considered a key step for improving the quality of care. However, simple dissemination of information has rarely been effective in changing clinical practices and behaviour.^{1,2} More specifically, in rheumatic and musculoskeletal diseases (RMDs), adherence to and uptake of recommendations are often suboptimal.^{3,4} This is critical as it has been demonstrated the benefit of the adherence to clinical recommendations.^{5,6}

Designing and conducting the implementation of recommendations are complex and daunting tasks, especially for those new to implementation and without specific training.⁷ For this purpose, the implementation science provides methods, processes and strategies to promote and accelerate the systematic implementation of proven (evidence-based) practices,⁷ for example, by developing an understanding of what influences implementation, or by testing behavioural, policy and

health system interventions to overcome barriers to implementation.⁸

On the other hand, implementation also requires participation and interaction of multiple actors, organisations and care levels, and the provision of resources (human, time and economic).⁹

The aim of this article is to provide a brief guide to principles that facilitate the implementation of recommendations in RMDs. It will contribute to improve the quality and effectiveness of health services and reduce variations in care for RMDs.

General principles of implementation

First of all, it is important to summarise the main general principles of implementation science.^{10,11} Without this educational basis, it is not possible to put the implementation of a single or a set of recommendations into practice successfully. These general principles include the phases of implementation that will be described in detail.

Figure 1 outlines the general principles of implementation: (1) the multilevel approach, (2) the need to prioritise and adapt, (3) the implementation team, (4) the nature of the implementation process, (5) the need for resources and (6) the phases of implementation.

Connected to the multilevel approach, recommendations can influence three levels (macro, meso, micro), all of which might have an impact on implementation. The macro-level is the policy level. Depending on the country, health policy-makers might decide, for example, which biological therapies are available nationally, or provide financial support in case of implementing specific recommendations.¹² National societies of rheumatology would be at this macro-level as well. The meso-level (primary care, regional organisations, patient charities or hospitals) addresses decentralisation, common in many health systems worldwide, and organisational aspects.¹¹ At this level, clinical protocols and pathways may ‘encourage or promote’ specific treatment alternatives over others and decisions on human resources allocation are also made (eg, nurses specialised in RMDs). The micro-level corresponds to the clinicians, healthcare professionals and patients, who will eventually decide, for example, which type of exercises is more



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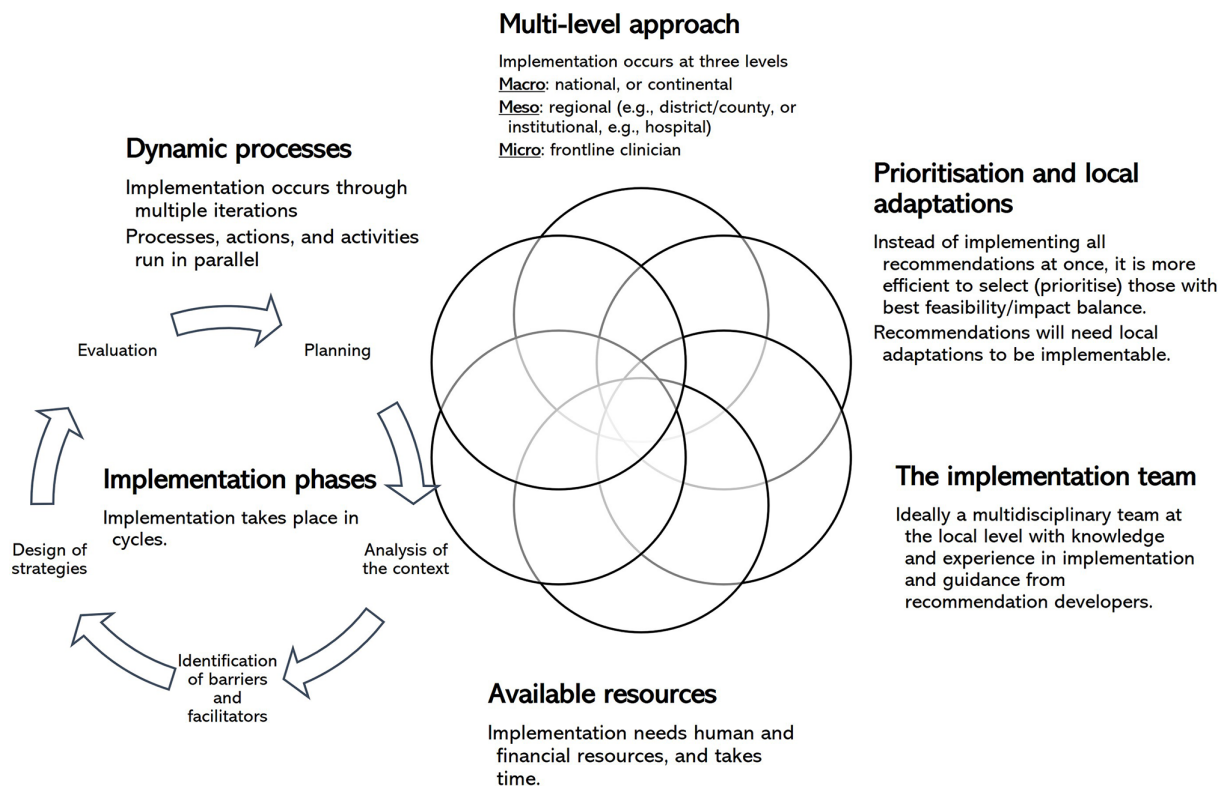


Figure 1 Principles of implementation and its phases.

appropriate for individual patients with RMD or which joints to examine.

Implementation can be determined through prioritisation and local adaptations. Prioritisation refers to the selection of recommendations to put into practice, usually based on feasibility, potential for impact, patient and population need, etc. The adaptation of recommendations to local needs might be necessary, and how it is implemented may vary in different health systems where there may be different professional roles, access to drugs, etc. A recommendation can propose an intervention, for example, a joint education programme provided by occupational therapists, but in a specific setting, where occupational therapists are not available, this task can be offered by a specialised nurse or physiotherapist.

The implementation team is necessary at the local level and should be multidisciplinary, ideally with guidance from those who developed the recommendations and could vary depending on the recommendations to implement (eg, one may need a politician, another a pharmacist). Besides a team, other resources necessary for implementation can include time, financial support, patient and public involvement and engagement, and digital innovation.

Implementation requires specific knowledge mobilisation skills and training, not only the implementation team but also the clinical guideline developers. A minimum implementation knowledge includes the basis, methodology, and processes of implementation science and the practical application of theory.

Although implementation is better apprehended in its phases (table 1), it is critical to acknowledge that many processes and actions will run in parallel and circles based on immediate feedback from the field; as implementation is an iterative and dynamic process.

A final educational point is the **terminology** used, which will be new to many. The Effective Practice and Organisation of Care of the Cochrane Collaboration provides terms and definitions.¹³

Here, for example, ‘continuity of care’ is defined as ‘Interventions to reduce fragmented care and undesirable consequences of fragmented care, for example, by ensuring the responsibility of care is passed from one facility to another so the patient perceives their needs and circumstances are known to the provider’.

Implementation phases

Regarding the phases of implementation (table 1), the implementation of any recommendation starts with an implementation plan. Usually, implementation planning starts upon guideline completion.¹⁴ However, implementation is more successful if planning occurs concurrently rather than consecutively to recommendations development, or even before sometimes so that the recommendations issued are clear and usable, target users are primed for adoption, and their needs and preferences are taken into account.¹⁵ Implementation plan templates are abundant on the internet, most of which only highlight the actions and actors involved. It is important to determine in this plan which is the recommendation’s implementation objective (eg, to increase uptake of core treatment, to implement exercise in spondyloarthritis or having rheumatologists perform synovial fluid aspiration in patients with undiagnosed inflammatory arthritis).

An analysis of context will afterwards assess the organisational, community and individual readiness for change.¹⁶ This analysis should identify the care level/s and their relationships (eg, at what level are specific decisions related to the recommendation taken), the organisational culture and climate (eg, whether the national societies have the power to homogenise behaviours), which teams will be likely involved in the implementation (eg, whether a primary care physician should be included), and which are the human, material, economic and time resources available, including a precise description of the information systems. The latter will be critical to both evaluate and ensure that the recommendation is implemented. The analysis of the context requires

Table 1 Clinical recommendation implementation phases

Phase	Description	Practicalities
1. Planning	The implementation plan is reflected in a protocol that includes the following headings: <ul style="list-style-type: none"> ▶ Background ▶ Objectives ▶ Implementation team ▶ Contact and involved stakeholders ▶ Milestones ▶ Budget ▶ Evaluation plan 	<ul style="list-style-type: none"> ▶ Templates ▶ Abundance of examples on the internet
2. Analysis of the context	It should identify and describe at a minimum: <ul style="list-style-type: none"> ▶ the care level/s and their relationships (from policies to hospital and public), interactions, mediators or determinants (eg, human and economic resources) ▶ the organisational culture and climate ▶ the teams to be involved in the implementation process ▶ the human, material, economic and time resources available ▶ the information systems 	<p>Narrative review based on interviews with local stakeholders and organisational data.</p> <p>An analysis can be developed by each country or region and then be reviewed:</p> <ul style="list-style-type: none"> ▶ with each set of recommendations, that may require specific items ▶ periodically
3. Identification of barriers and facilitators	These should reflect factors related to: <ul style="list-style-type: none"> ▶ health professionals ▶ social context (including patients) ▶ organisational context ▶ the recommendations itself 	Use brainstorming, Delphi, nominal or focus groups, qualitative interviews, communities of practice or surveys (qualitative research techniques).
4. Design of strategies	These can be tools, actions or activities. Will imply economic, organisational or regulatory aspects. The focus can be on clinicians, health professionals or patients.	Examples are leaflets, courses, clinical sessions, local consensus documents, changes in regulation, recruitment of health professionals, checklists, standards of care, decision rules or algorithms in electronic medical records, protocols, clinical pathways, etc.
5. Evaluation	It implies the definition of quality indicators. These include: <ul style="list-style-type: none"> ▶ what to measure ▶ how to measure it ▶ sources and timing 	Whenever possible, use quality indicators already developed in rheumatology.
6. Review	Evaluation of the implementation process and related decisions.	Periodical meetings of the implementation team to check on plan and quality indicators.

accurate knowledge of current clinical practice in the setting.¹⁶ For example, in the recommendations dealing with the transition of care from paediatrics to adult rheumatology, the age at which children become adults in the different health systems varies across countries.¹⁷

The following phase is the identification of barriers and facilitators. These are factors that hinder or facilitate, totally or partially, the implementation of a change in clinical practice, which are related to health professionals, social (including patients) and organisational context or to the recommendations.^{18–19} Many techniques can be used to identify them, such as Delphi, nominal groups, qualitative interviews, surveys, communities of practice, etc.²⁰ The Eumusc.net project identified several facilitators and barriers in European rheumatology.²¹

Next is the design or selection of implementation strategies, that is, the interventions that will facilitate the implementation of recommendations.^{22–23} Implementation needs to be adjusted for the various target populations and organisations and to offer educational and practical tools. Therefore, strategies include economic, organisational, or regulatory tools, actions and activities focused on clinicians, health professionals and patients. A non-exhaustive list includes leaflets, courses, clinical sessions, local consensus documents, decision rules, checklists, standards of care, electronic medical records or decision-making programmes.^{22–24–26} However, the efficacy of these strategies is variable.^{25–26}

The evaluation of the implementation is the subsequent step,²⁷ and is not only related to the outcome of the implementation but also the implementation process. Selected recommendations can

be transformed into quality measures (ie, indicators and standards of indicators), which are observed before and after the implementation (eg, waiting list, time to access rheumatologist, time to remission).²⁸ There are examples of quality indicators in rheumatology.^{4 28–30} The whole implementation process can also be evaluated with checklists.

The final phase is the review or replanning. This phase includes taking into consideration the evaluation of the whole implementation process and, if necessary, to redesign or redefine a new implementation plan or even de-implement strategies that do not produce the expected outcome.

CONCLUSIONS

The adherence to and uptake of clinical recommendations impact on outcomes of patients with RMDs. However, clinical recommendations' simple dissemination (journal publication, congress communication, etc) has rarely been effective in changing clinical practices and behaviour. Implementation science provides a framework to facilitate the implementation of recommendations. Implementation should start early, even before the clinical guideline developmental processes and complete all of the phases of the implementation.

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REFERENCES

- Schectman JM, Schroth WS, Verme D, *et al*. Randomized controlled trial of education and feedback for implementation of guidelines for acute low back pain. *J Gen Intern Med* 2003;18:773–80.
- Cherkin DC, Deyo RA, Street JH, *et al*. Pitfalls of patient education. limited success of a program for back pain in primary care. *Spine* 1996;21:345–55.
- Gvozdenović E, Allaart CF, van der Heijde D, *et al*. When rheumatologists report that they agree with a guideline, does this mean that they practise the Guideline in clinical practice? results of the International recommendation implementation study (iris). *RMD Open* 2016;2:e000221.
- Perez-Ruiz F, Carmona L, Yébenes MJG. An audit of the variability of diagnosis and management of gout in the rheumatology setting: the gout evaluation and management study. *J Clin Rheumatol* 2011;17:349–55.
- Zanetti A, Scirè CA, Argani L, *et al*. Can the adherence to quality of care indicators for early rheumatoid arthritis in clinical practice reduce risk of hospitalisation? retrospective cohort study based on the record linkage of rheumatic disease study of the Italian Society for rheumatology. *BMJ Open* 2020;10:e038295.
- López-Medina C, Dougados M, Collantes-Estévez E, *et al*. Adherence to recommendations for the use of anti-tumour necrosis factor and its impact over 5 years of follow-up in axial spondyloarthritis. *Rheumatology* 2018;57:880–90.
- Hull L, Goulding L, Khadjesari Z, *et al*. Designing high-quality implementation research: development, application, feasibility and preliminary evaluation of the implementation science research development (ImpRes) tool and guide. *Implement Sci* 2019;14:80.
- Swaithes L, Paskins Z, Dziedzic K, *et al*. Factors influencing the implementation of evidence-based guidelines for osteoarthritis in primary care: a systematic review and thematic synthesis. *Musculoskeletal Care* 2020;18:101–10.
- Nilsen P. Making sense of implementation theories, models and frameworks. *Implement Sci* 2015;10:53.
- Sharp CA, Swaithes L, Ellis B, *et al*. Implementation research: making better use of evidence to improve healthcare. *Rheumatology* 2020;59:1799–801.
- Barasa EW, Molyneux S, English M, *et al*. Setting healthcare priorities at the macro and meso levels: a framework for evaluation. *Int J Health Policy Manag* 2015;4:719–32.
- Marín-Jiménez I, Carrascosa JM, Guigini MA, *et al*. Knowledge, perceptions, attitude, barriers and facilitators of biosimilars use across specialty physicians and hospital pharmacists: a national survey. *Farm Hosp* 2021;45:240–6.
- Cochrane Organization. Effective practice and organisation of care (EPOC). EPOC taxonomy, 2015. Available: epoc.cochrane.org/epoc-taxonomy [Accessed Jan 2021].
- Gagliardi AR, Marshall C, Huckson S, *et al*. Developing a checklist for guideline implementation planning: review and synthesis of Guideline development and implementation advice. *Implement Sci* 2015;10:19.
- Gagliardi AR, Brouwers MC. Integrating Guideline development and implementation: analysis of Guideline development manual Instructions for generating implementation advice. *Implement Sci* 2012;7:67.
- Kitson A, Harvey G, McCormack B. Enabling the implementation of evidence based practice: a conceptual framework. *Qual Health Care* 1998;7:149–58.
- Foster HE, Minden K, Clemente D, *et al*. EULAR/PreS standards and recommendations for the transitional care of young people with juvenile-onset rheumatic diseases. *Ann Rheum Dis* 2017;76:639–46.
- Cabana MD, Rand CS, Powe NR, *et al*. Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA* 1999;282:1458–65.
- Swaithes L, Dziedzic K, Finney A, *et al*. Understanding the uptake of a clinical innovation for osteoarthritis in primary care: a qualitative study of knowledge mobilisation using the i-PARIHS framework. *Implement Sci* 2020;15:95.
- Bazen A, Barg FK, Takeshita J. Research techniques made simple: an introduction to qualitative research. *J Invest Dermatol* 2021;141:e241:241–7.
- Moe RH, Petersson IF, Carmona L, *et al*. Facilitators to implement standards of care for rheumatoid arthritis and osteoarthritis: the EUMUSC.NET project. *Ann Rheum Dis* 2014;73:1545–8.
- Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. *Lancet* 2003;362:1225–30.
- Oxman AD, Thomson MA, Davis DA, *et al*. No magic bullets: a systematic review of 102 trials of interventions to improve professional practice. *CMAJ* 1995;153:1423–31.
- Hetland ML. DANBIO—powerful research database and electronic patient record. *Rheumatology* 2011;50:69–77.
- Grimshaw J, Eccles M, Thomas R, *et al*. Toward evidence-based quality improvement. Evidence (and its limitations) of the effectiveness of guideline dissemination and implementation strategies 1966–1998. *J Gen Intern Med* 2006;21 Suppl 2:S14–20.
- Grimshaw JM, Thomas RE, MacLennan G, *et al*. Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technol Assess* 2004;8:1–72.
- Hakkennes S, Green S. Measures for assessing practice change in medical practitioners. *Implement Sci* 2006;1:29.
- Petersson IF, Strömbeck B, Andersen L, *et al*. Development of healthcare quality indicators for rheumatoid arthritis in Europe: the eumusc.net project. *Ann Rheum Dis* 2014;73:906–8.
- Chavatzka K, Kostopoulou M, Nikolopoulos D, *et al*. Quality indicators for systemic lupus erythematosus based on the 2019 EULAR recommendations: development and initial validation in a cohort of 220 patients. *Ann Rheum Dis* 2021;80:1175–82.
- Kiltz U, Landewé RBM, van der Heijde D, *et al*. Development of ASAS quality Standards to improve the quality of health and care services for patients with axial spondyloarthritis. *Ann Rheum Dis* 2020;79:193–201.