

EPIDEMIOLOGICAL SCIENCE

2022 EULAR points to consider for remote care in rheumatic and musculoskeletal diseases

Annette de Thurah ^{1,2} Philipp Bosch,³ Andrea Marques,^{4,5} Yvette Meissner ⁶, Chetan B Mukhtyar ⁷, Johannes Knitza ⁸, Aurélie Najm ⁹, Nina Østerås ¹⁰, Tim Pelle,^{11,12} Line Raunsbæk Knudsen,^{1,2} Hana Šmucrová,¹³ Francis Berenbaum ¹⁴, Meghna Jani ¹⁵, Rinie Geenen,¹⁶ Martin Krusche ¹⁷, Polina Pchelnikova,¹⁸ Savia de Souza,^{19,20} Sara Badreh,²¹ Dieter Wiek,²² Silvia Piantoni ²³, James M Gwinnutt,¹⁵ Christina Duftner ²⁴, Helena M Canhã,²⁵ Luca Quartuccio,²⁶ Nikolay Stoilov,²⁷ Yeliz Prior ²⁸, Johannes WJ Bijlsma ²⁹, Alen Zabotti ²⁶, Tanja A Stamm ^{30,31} Christian Dejaco ^{3,32}

Handling editor Kimme L Hyrich

► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/annrheumdis-2022-222341>).

For numbered affiliations see end of article.

Correspondence to

Dr Annette de Thurah, Rheumatology, Aarhus University Hospital, Aarhus 8240, Denmark; annethur@rm.dk

Received 11 February 2022

Accepted 7 April 2022

Published Online First

25 April 2022



© Author(s) (or their employer(s)) 2022. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: de Thurah A, Bosch P, Marques A, et al. *Ann Rheum Dis* 2022;**81**:1065–1071.

ABSTRACT

Background Remote care and telehealth have the potential to expand healthcare access, and the COVID-19 pandemic has called for alternative solutions to conventional face-to-face follow-up and monitoring. However, guidance is needed on the integration of telehealth into clinical care of people with rheumatic and musculoskeletal diseases (RMD).

Objective To develop EULAR points to consider (PtC) for the development, prioritisation and implementation of telehealth for people with RMD.

Methods A multidisciplinary EULAR task force (TF) of 30 members from 14 European countries was established, and the EULAR standardised operating procedures for development of PtC were followed. A systematic literature review was conducted to support the TF in formulating the PtC. The level of agreement among the TF was established by anonymous online voting.

Results Four overarching principles and nine PtC were formulated. The use of telehealth should be tailored to patient's needs and preferences. The healthcare team should have adequate equipment and training and have telecommunication skills. Telehealth can be used in screening for RMD as preassessment in the referral process, for disease monitoring and regulation of medication dosages and in some non-pharmacological interventions. People with RMD should be offered training in using telehealth, and barriers should be resolved whenever possible.

The level of agreement to each statement ranged from 8.5 to 9.8/10.

Conclusion The PtC have identified areas where telehealth could improve quality of care and increase healthcare access. Knowing about drivers and barriers of telehealth is a prerequisite to successfully establish remote care approaches in rheumatologic clinical practice.

INTRODUCTION

The prevalence of rheumatic and musculoskeletal diseases (RMD¹) ('A diverse group of diseases that commonly affect the joints, but can also affect the

Key messages**What is already known on this subject?**

- ⇒ Remote care and telehealth can improve healthcare access and outcomes, particularly in the treatment of chronic diseases.
- ⇒ The COVID-19 pandemic made the use of telehealth even more frequent in rheumatology, with ad hoc implementation of remote care services in several centres.
- ⇒ Guidance is needed on how remote care and telehealth should be developed and integrated into long-term rheumatology clinical care.

What does this study add?

- ⇒ These points to consider indicate how telehealth should be developed and implemented in routine clinical care of people with rheumatic and musculoskeletal diseases (RMD).
- ⇒ They cover several aspects including screening for RMD, preassessment in the referral process, disease monitoring and modification of medication dosages and non-pharmacological interventions.
- ⇒ The task force identified drivers and barriers to telehealth, which may support a timely implementation in clinical practice.
- ⇒ These points to consider can be used to tailor telehealth to needs and preferences of people with RMD.

How might this impact on clinical practice or future developments?

- ⇒ These points to consider can guide the development of national and local telehealth strategies to support best clinical practice.

muscles, other tissues and internal organs') in developed countries has increased by 60% from 1990 to 2010 and is expected to continue rising. An ageing population, earlier diagnosis and improved survival among people with RMD are the main reasons for the increased prevalence.^{2,3} Compounded by

a relative drop in the number of rheumatologists⁴ and other healthcare providers (HCPs), the pressure on the healthcare system has increased.^{5,6} Waiting times for a new or follow-up rheumatology appointment have grown, hampering implementation of guidelines for good clinical care.⁷ Alternative forms of care using telehealth for follow-up of people with RMD and for self-management interventions may preserve and even improve quality of care.

Remote care makes use of digital technologies—so-called ‘telehealth’ interventions.⁸ It is used in all parts of the patient pathway, including communication with patients/caregivers, disease screening or monitoring of different aspects of the disease (eg, disease activity, damage, quality of life, adherence, etc). It can be delivered synchronously (HCP and patient being present at the same time) or asynchronously and be divided into three main types of modalities: *live video* (synchronous) and the asynchronous modalities: *store and forward* (transmission of recorded health history) and *remote patient monitoring*.⁹

Telehealth can improve healthcare access and outcomes, particularly in the treatment of chronic diseases.¹⁰ It can reduce demands on overstretched facilities and make the health sector more resilient⁸ and has become even more relevant during the COVID-19 pandemic when it has been difficult to deliver face-to-face care and investigations as usual.^{11,12} Furthermore, the COVID-19 pandemic has resulted in wider use of telehealth services, and remote care has become much more socially acceptable.¹³

However, guidance is needed on how telehealth should be integrated into routine clinical care.

The aim of this EULAR task force (TF) was to formulate points to consider (PtC) for the development, prioritisation and implementation of remote care and telehealth for people with RMD. The target users are people with RMD and their relatives, physicians and other HCPs involved in the care of people with RMD, regulators and policy makers.

In the context of these PtC and following the definition of the WHO, telehealth was defined as: ‘the use of telecommunications and virtual technology to deliver healthcare outside of traditional healthcare facilities’.⁸ Remote care was defined as ‘the provision of care using telehealth and virtual technology allowing patients to be evaluated, monitored and possibly treated while the patient and HCP are physically remote from each other’.

METHODS

This work was conducted using the 2014 updated EULAR standardised operating procedures for developing PtC/recommendations.¹⁴ After approval from the EULAR Executive Committee, the conveners (AdT and CD) and fellows (PB and AM) formed an international TF representing 14 European countries. TF members included one methodologist and two comethodologists (TAS, CBM and YM), rheumatologists (including one representative from EMEUNET), one epidemiologist (also representing EMEUNET), health professionals in rheumatology (nurses, occupational therapists, physiotherapists and one psychologist) and four people with RMD. In preparation for the application of this project to EULAR, a broad scoping review (online supplemental appendix 1) was undertaken to map the current research and knowledge gaps within remote care interventions in rheumatology. A scoping review does not aim to produce a critically appraised and synthesised result nor to answer a particular question, but rather to provide an overview of the contents of effect studies on this topic.¹⁵ As such, the scoping review was presented at the first TC meeting and informed the outlined

research questions and the search strategy in the systematic literature review (SLR): what is the efficacy, safety, cost-effectiveness, user perception and adherence of remote care or blended care as compared with standard care in people with RMD? How is remote care delivered/tailored to people with RMD and integrated into clinical practice? What are the drivers and barriers for implementation of remote care in clinical practice? These questions were transformed into the PICO (Population, Intervention, Comparator, Outcome) format, driving the development of the search strategy for the SLR. The SLR was conducted by the two fellows under the guidance of the methodologist and two comethodologists in accordance with the Cochrane Handbook.¹⁶ The results of the SLR were reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines¹⁷ and have been published separately.

The two TF meetings were held via a virtual online platform. During the first meeting in November 2020, definitions for remote care and telehealth were discussed and the key questions were phrased.

During the second virtual meeting, held in April 2021, the TF members formulated the overarching principles and PtC based on evidence from the SLR and expert opinion, through a nominal group process. Consensus was accepted in the first round if >75% of the members voted in favour of a statement. As all statements were accepted in the first round, no additional rounds were necessary. Finally, each TF member anonymously indicated their level of agreement (LoA) to each statement using Survey Monkey (LoA, 0–10 numeric rating scale ranging from 0 = ‘completely disagree’ to 10 = ‘completely agree’). The mean and SD of the LoA as well as the percentage of TF members with an agreement ≥ 8 are presented. The level of evidence was assigned to each statement based on the standards of the Oxford Centre for Evidence Based Medicine.¹⁸

Finally, a research agenda was formulated based on evidence gaps and controversial points. The final manuscript was reviewed and approved by all TF members and the EULAR Council.

RESULTS

An overview of the overarching principles and PtC can be found in [table 1](#).

The TF identified key themes considered to apply across all PtC, formulated and agreed on them as four overarching principles. They are not necessarily a direct result of the SLR, but considered to be fundamental aspects of the specific area and form the framework for the PtC.

Overarching principles

Tailored care combining remote and face-to-face attendance should be based on shared decision-making as well as the needs and preferences of people with RMD

The decision on using remote care should be tailored to the patient’s needs and preferences including demographic, social situation, geographical access to healthcare, employment status, specific diagnosis, comorbidities, disease phase and status, that is, in a newly onset rheumatoid arthritis (RA), a face-to-face visit should be performed, but telehealth may be optimal for education about disease symptoms, disease activity, therapy and self-management. Patients with a well-established diagnosis, stable disease activity and less complex diseases can be offered the use of telehealth solutions.¹⁹ Patients with long-standing, stable RA might require less education and training and their treatment might not need modification. Some of these patients may prefer telehealth consultations rather than hospital visits. Similarly, a

Table 1 EULAR points to consider for the use of remote care in people with RMD

Overarching principles	LoE	LoA*
A. Tailored care combining remote and face-to-face attendance should be based on shared decision-making as well as the needs and preferences of people with RMD.	n.a.	9.7 (0.7) 96.6%>8
B. Remote care† for people with RMD can be delivered by all members of the healthcare team using a variety of telehealth techniques.	n.a.	9.1 (1.3) 86.2%>8
C. Telehealth‡ interventions should be developed in collaboration with all stakeholders including the healthcare team, caregivers and people with RMD.	n.a.	9.7 (0.7) 100%>8
D. Members of the healthcare team involved in remote care interventions should have adequate equipment and training, as well as telecommunication skills.	n.a.	9.7 (0.7) 96.6%>8
Specific points to consider		
1. Pre-assessment by telehealth may be considered to improve the referral process to rheumatology and help prioritisation of people with suspected RMD.	2b	8.5 (2.1) 82.1%>8
2. Telehealth may assist pre-diagnostic processes for RMD; however, diagnosis should be established in a face-to-face visit.	2b	8.7 (2.0) 71.4%>8
3. The decision to initiate disease-modifying drugs should be made in a face-to-face visit. Telehealth may be used for drug education, monitoring and facilitating adherence.	2b	9.1 (1.4) 89.3%>8
4. Dose modifications or suspension of disease-modifying drugs, as well as addition of analgesics, NSAIDs or glucocorticoids can be discussed with people with RMD using telehealth.	2b	9.3 (1.3) 92.9%>8
5. Telehealth can be used to monitor symptoms, disease activity and other outcomes.	2b	9.6 (0.8) 96.4%>8
6. Telehealth may be used to discuss the need for a face-to-face consultation or other interventions.	2b	9.8 (0.7) 96.4%>8
7. Telehealth should be considered for non-pharmacological interventions including, but not limited to, disease education, advice on physical activity and exercise, self-management strategies and psychological treatment.	2b	9.4 (1.1) 92.9%>8
8. Barriers to remote care should be evaluated and resolved wherever possible.	5	9.7 (0.8) 96.4%>8
9. People with RMD using remote care should be offered training in using telehealth.	5	9.5 (1.0) 96.4%>8

*LoA, level of agreement (mean (SD)).
†Remote care: the provision of care using telehealth and virtual technology allowing patients to be evaluated, monitored and possibly treated while the patient and HCP are physically remote from each other.
‡Telehealth: the use of telecommunications and virtual technology to deliver healthcare outside of traditional healthcare facilities.
HCP, healthcare provider; LoA, level of agreement; LoE, level of evidence; NSAIDs, nonsteroidal anti-inflammatory drugs; RMD, rheumatic and musculoskeletal disease.

younger patient in full-time employment living far away from the hospital might prefer telehealth, whereas an elderly patient living nearby and with limited access to technology might opt for a face-to-face visit.

Remote care for people with RMD can be delivered by all members of the healthcare team using a variety of telehealth techniques. As is seen in online supplemental table 1, telehealth makes use of different types of technology and modalities. Not all services in the RMD care pathway can be delivered remotely; but allowing for security, feasibility and need, all members of the healthcare team can deliver them. Different services are offered by different HCPs. Interventions within diagnostics, for example, are usually delivered by physicians; whereas interventions on training and exercise are mostly managed by physiotherapists. Monitoring

of disease activity, rehabilitation and self-management interventions may involve different HCPs (online supplemental table 1).

Telehealth interventions should be developed in collaboration with all stakeholders including the healthcare team, caregivers and people with RMD

User involvement by all stakeholders (eg, patients, carers, HCPs and decision-makers) are believed to be important in order to overcome usability issues of telehealth solutions.^{20 21} Patients are at the centre of this process, and the goal is to develop user-friendly, intuitive and effective technology that helps to improve healthcare services from a patient's perspective. It is essential to include HCPs in order to reflect daily clinical practice, that is, by letting them propose, which intervention can be delivered remotely and how technology could be incorporated into the overall clinical evaluation and workflow. The involvement of administration personnel and funding bodies is required to guarantee reimbursement of services and to prevent additional bureaucracy to HCPs and patients.

Members of the healthcare team involved in remote care interventions should have adequate equipment and training as well as telecommunication skills

Successful telehealth interventions require that the healthcare team receives training in telehealth communication, interaction, legacy and clinical assessment.²² Despite great interest, HCPs often are unaware of available telehealth tools¹² and should take responsibility for their ongoing professional development,²³ but healthcare organisations are also responsible for preparing the workforce for telehealth-based clinical practice.²² In future, telehealth should be incorporated into the existing curricula at universities and other healthcare educational institutions, so that HCPs can develop the skills to provide safe and competent telehealth care.

PtC 1: Preassessment by telehealth may be considered to improve the referral process to rheumatology and help prioritisation of people with suspected RMD

Waiting lists within rheumatology are forecasted to become longer in the future.²⁴ Effective prioritisation is, therefore, key to guarantee rapid access to those patients with the most severe and active diseases. A short preassessment via telehealth may help to decide on this priority, advise patients and other HCPs on which tests should be done and/or whether another specialist should be involved first. The SLR identified one study showing that referrals could be triaged by a nurse practitioner, with a rheumatologist participating in the encounter via a tele-link.²⁵ Agreement to this statement was lower than to other PtC, mainly because the TF was of the opinion that more evidence is needed about which preassessment methods are most appropriate as well as in which patients and at what level of the referral process they should be applied.

PtC 2: Telehealth may assist prediagnostic processes for RMD; however, diagnosis should be established in a face-to-face visit.

During a face-to-face visit, additional information (resulting from personal interaction and clinical and physical examinations) helps to make a diagnosis. For that reason, face-to-face visits are indispensable to rheumatology. The final diagnosis may certainly be made after a face-to-face visit, as well, and discussed with the patient remotely, for example, when the clinician needs to wait for blood tests or images.

Patients with risk factors for developing an inflammatory rheumatic disease (eg, patients with psoriasis without arthritis, people with positive autoantibodies but no inflammatory symptoms and people with positive family medical history for systemic autoimmune disease) would benefit from screening using telehealth techniques. Hence, regular monitoring via telehealth could help to facilitate a face-to-face visit at the appropriate time. In other situations, where diagnosis largely depends on history and imaging (eg, for axial spondyloarthritis), several parts of the prediagnostic process could be handled by telehealth, and a face-to-face visit could be scheduled when treatment is initiated. Evidence indicates that such telehealth interventions may save unnecessary visits, time and resources for patients, the healthcare system and society.^{24 26}

PtC 3: The decision to initiate disease-modifying drugs should be made in a face-to-face visit. Telehealth may be used for drug education, monitoring and facilitating adherence

The TF agreed that the decision to initiate or change disease-modifying antirheumatic drugs (DMARDs) would usually take place on the background of active disease, requiring a face-to-face consultation. However, a telehealth appointment may be more optimal to reinforce information and education to improve adherence to treatment, especially when the patient is in familiar surroundings and possibly with relatives. The SLR identified evidence that telehealth could be used for drug education, monitoring and facilitating adherence to drugs,^{27–29} and that patients believe they can benefit from telehealth-provided drug information, but prefer it to complement face-to-face information rather than replacing it.³⁰

PtC 4: Dose modifications or suspension of DMARDs as well as addition of analgesics, NSAIDs or glucocorticoids can be discussed with people with RMD using telehealth

In chronic inflammatory arthritis such as RA, optimal sequencing of DMARDs is important as the disease often fluctuates between active disease and remission.^{31 32} The SLR identified some evidence that an intensive treatment strategy based on telehealth led to increased remission rates and a decrease in functional impairment.³³ The TF was also of the opinion that telehealth could be used in cases of infection, adverse events or abnormal lab results, where temporal or permanent discontinuation of DMARDs is needed. Furthermore, addition of analgesics, non-steroidal antiinflammatory drugs (NSAIDs) and glucocorticoids could be prescribed remotely as bridging therapies or to treat minor flares, residual disease activity and comorbidities until patients receive face-to-face assessment.

PtC 5: Telehealth can be used to monitor symptoms, disease activity and other outcomes

According to the EULAR treat-to-target (T2T) recommendation, disease activity in inflammatory arthritis should be evaluated every 1–6 months depending on disease activity and severity.³⁴ Due to resource constraints, a full implementation of T2T in rheumatology practice is still scarce.³⁵ In patients with low, stable disease activity, telehealth follow-up may be a valid alternative to face-to-face visits, given that this approach can make room for new patients or patients with more complex disease presentation. It may also help to monitor changes or emerging trends during long-term follow-up.

The SLR identified two randomised controlled trials (RCTs) indicating that in patients with sustained remission, telehealth follow-up resulted in similar outcomes, including disease activity,

physical function and quality of life compared with regular face-to-face visits.^{36 37}

PtC6: Telehealth may be used to discuss the need for a face-to-face consultation or other interventions

Telehealth can be a low-barrier opportunity to get in contact with the healthcare system either by a telephone helpline, a chat function or a secure email service. By doing so, patients can be referred for a face-to-face visit, a specific examination (eg, blood test or imaging) or to another specialist. The SLR identified one RCT showing that telehealth is a good platform for reaching a shared decision between the patient and the HCP.³⁸ Another study concluded that telehealth can be used to decide whether patients require a face-to-face consultation.³⁶

PtC 7: Telehealth should be considered for non-pharmacological interventions including but not limited to disease education, advice on physical exercise, self-management strategies and psychological intervention

The SLR identified several studies that supported the use of telehealth as an intervention to promote physical activity and exercise.^{39–44} The TF debated the mechanism of delivery of any non-pharmacological intervention considering the possibilities of delivering this entirely face-to-face, remotely or combinations thereof. The TF agreed that it depends on patient factors such as previous experience with the intervention and the intervention itself. Disease education, for example, may not require face-to-face visits, whereas complex physical exercises should preferably be instructed and checked face-to-face.

PtC 8: Barriers to telehealth care should be evaluated and resolved wherever possible

Telehealth has the potential to provide access to resources and care, increase flexibility and reduce waiting lists and patient travel time. However, some barriers that might obstruct successful implementation of telehealth must be assessed systematically.^{30 41 45–52}

In [table 2](#), we depict a list of possible barriers identified in the SLR and by the TF members and provide suggestions on how these barriers could be resolved. This list is not exhaustive but may form the basis for the development of local checklists enabling implementation of telehealth into clinical practice.

PtC 9: People with RMD using remote care should be offered training in using telehealth

Training of members of the healthcare team in telehealth techniques and communication skills was seen as an overarching principle; however, the TF agreed that a separate statement was needed on training people with RMD in using telehealth. Many of the included surveys and qualitative studies refer to problems with digital literacy.^{46 52–54} People with RMD should be offered training in using telehealth solutions and should be informed how to prepare for a telehealth consultation (eg, by having questions prepared, sitting in a quiet place, etc). Any member of the healthcare team, depending on the local setting, can offer this training.

Based on the discussions and the areas of uncertainty, a research agenda has been proposed, which is depicted in [box 1](#).

DISCUSSION

The current paper presents the first EULAR PtC on the use of telehealth in daily clinical rheumatology practice. These PtC can be used to inform and guide the development of national

Table 2 Identified barriers to telehealth and suggested interventions to overcome them

Factors	Identified barriers	Suggested interventions
Patient factors	Patient reluctance ^{30 45 47 51 62} Varying digital and health literacy skills ^{46 47 51 53} Lack of access to necessary equipment ^{46 54}	<ul style="list-style-type: none"> ▶ Integration of digital support into routine patient education ▶ Assessment of the patient's health literacy before referral to telehealth care ▶ Assessment of the patient's digital skills before referral to telehealth care ▶ Assessment of access to required equipment before referral to telehealth
Clinical factors	No possibility of face-to-face clinical and instrumental examination ^{45 47 49 63} Disease burden, medical and psychological comorbidity ^{45 62}	<ul style="list-style-type: none"> ▶ Assessment before referral: Will telehealth provide all necessary information needed to make a clinical decision? ▶ Assessment before referral: Will telehealth be safe for this patient?
Healthcare provider factors	Lack of training ^{48 49}	<ul style="list-style-type: none"> ▶ Ensure necessary competencies by providing training on telehealth communication, interaction, legacy and clinical assessment
Organisational factors	Lack of data security ^{51 54} Lack of approval for reimbursement from insurance companies ⁴⁴	<ul style="list-style-type: none"> ▶ Ensure that the telehealth interventions follow national and local obligations on legacy such as privacy and security requirements ▶ Involve payers and administration from the beginning in the development of telehealth interventions

recommendations and local telehealth solution and complement previous EULAR PtC for the development, evaluation and implementation of mobile health application aiding self-management of people with RMD.⁵⁵

Within rheumatology, telehealth has been discussed in the context of the increasing prevalence of RMD and workforce limitations.^{2 6} Recently, the COVID-19 pandemic has made telehealth even more relevant with 78% of patients finding it acceptable.⁵⁶ A recent EULAR survey conducted in 35 countries showed that during the pandemic, the majority of European face-to-face consultations were converted into telehealth consultations.⁴⁶ However, that study also pointed out that more research within tele-rheumatology is needed.⁴⁶

As this is a relatively new research area, the present, PtC are only partially supported by evidence. Furthermore, few of the studies addressed disease monitoring in inflammatory arthritis.^{33 36 37 57} PtC 8 (barriers) and 9 (training of people with RMD) are mainly based on qualitative research that is considered low quality of evidence by the Oxford hierarchy.¹⁸ This does, however, not indicate a lower importance of these PtC.

Box 1 Research agenda

Remote care in rheumatic and musculoskeletal diseases—identified unmet needs and suggested focus for future research:

- ⇒ To conduct randomised non-inferiority and superiority trials to test the efficacy and patient satisfaction of telehealth interventions as compared with conventional care.
- ⇒ To perform longitudinal studies to test if telehealth leads to more or less treatment changes.
- ⇒ To evaluate methods of preassessment and prioritisation within different settings and diseases.
- ⇒ To evaluate the cost-effectiveness of telehealth interventions.
- ⇒ To explore factors associated with digital health literacy (for both, people with RMD and HCPs).
- ⇒ To explore barriers to the implementation of telehealth and how they can be solved.
- ⇒ To explore how artificial intelligence can be integrated into telehealth interventions in order to support the development of knowledge of clinical processes.
- ⇒ To evaluate patient safety and data security when using telehealth in daily clinical practice and in an extended follow-up.

Telehealth has been promoted as a means to increase cost-effectiveness, but this was only addressed in two studies on remote physiotherapy,^{58 59} revealing conflicting results.

Furthermore, in some studies, telehealth interventions were applied as an add-on to and not as a replacement of face-to-face contact.^{41 42 60 61} This makes a direct comparison between telehealth and face-to-face interventions difficult.

None of the included studies addressed security and potential adverse effects of telehealth interventions. Also, the follow-up time was generally short (mostly ≤1 year); therefore, it is not possible to make any conclusions about the long-term effects or potential harms of telehealth interventions. It is possible that more longitudinal studies looking at the effects of telehealth as opposed to routine care will become available in the next few years because of the greater shift to remote working during the COVID-19 pandemic.

In conclusion, these PtC identified several areas where telehealth may potentially improve quality of care and increase healthcare access within rheumatology. Although our SLR did not reveal any evidence on how to implement telehealth solutions, we identified barriers and facilitators that may potentially play a role for the implementation of telehealth interventions into clinical practice.

Author affiliations

- ¹Department of Rheumatology, Aarhus University Hospital, Aarhus, Denmark
- ²Department of Clinical Medicine, Aarhus University, Aarhus, Denmark
- ³Department of Rheumatology and Immunology, Medizinische Universität Graz, Graz, Austria
- ⁴Health Sciences Research Unit Nursing, Higher School of Nursing of Coimbra, Coimbra, Portugal
- ⁵Rheumatology, Centro Hospitalar e Universitário de Coimbra EPE, Coimbra, Portugal
- ⁶Epidemiology and Health Services Research, German Rheumatism Research Center Berlin, Berlin, Germany
- ⁷Vasculitis Service, Rheumatology Department, Norfolk and Norwich University Hospital NHS Trust, Norwich, UK
- ⁸Department of Internal Medicine 3, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany
- ⁹Institute of Infection, Immunity and Inflammation, College of Medical Veterinary and Life Sciences, University of Glasgow, Glasgow, UK
- ¹⁰National Advisory Unit on Rehabilitation in Rheumatology, Department of Rheumatology, Diakonhjemmet University College and Hospital, Oslo, Norway
- ¹¹Department of Rheumatic Diseases, Radboud University, Nijmegen, The Netherlands
- ¹²Department of Primary and Community Care, Radboud University, Nijmegen, The Netherlands
- ¹³Institute of Rheumatology, Centre of Medical Rehabilitation, Praha, Czech Republic
- ¹⁴Department of Rheumatology, Sorbonne Université, Paris, France
- ¹⁵Centre for Epidemiology Versus Arthritis, Centre for Musculoskeletal Research, Division of Musculoskeletal and Dermatological Sciences, Faculty of Biology, Medicine and Health, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK

¹⁶Department of Psychology, Utrecht University, Utrecht, The Netherlands
¹⁷Division of Rheumatology and Systemic Inflammatory Diseases, University Hospital Hamburg-Eppendorf (UKE), Hamburg, Germany
¹⁸Patient Research Partner, EULAR, Moscow, Russian Federation
¹⁹Centre for Rheumatic Diseases, King's College London, London, UK
²⁰Patient Research Partner, EULAR, London, UK
²¹Patient Research Partner, EULAR, Stockholm, Sweden
²²Patient Research Partner, EULAR, Bonn, Germany
²³Rheumatology and Clinical Immunology Unit, Department of Clinical and Experimental Sciences, ASST Spedali Civili di Brescia, Brescia, Italy
²⁴Department of Internal Medicine, Clinical Division of Internal Medicine II, Medical University Innsbruck/Tirol Kliniken GmbH, Innsbruck, Austria
²⁵Comprehensive Research Center, CHRC, EpicDoC Unit, CEDOC—NOVA Medical School—NOVA University of Lisbon, Portugal, Lisboa, Portugal
²⁶Department of Medical and Biological Sciences, Santa Maria della Misericordia University Hospital, Udine, Italy
²⁷Faculty of Medicine, University Hospital St. Ivan Rilski, Medical University of Sofia, Sofia, Bulgaria
²⁸Centre for Health Sciences Research, School of Health and Society, University of Salford, Salford, UK
²⁹Department of Rheumatology and Clinical Immunology, University Medical Center Utrecht, Utrecht, The Netherlands
³⁰Ludwig Boltzmann Institute for Arthritis and Rehabilitation, Vienna, Austria
³¹Section for Outcomes Research, Medical University of Vienna, Vienna, Austria
³²Department of Rheumatology, Hospital of Bruneck (ASAA-SABES), Bruneck, Italy

Twitter Chetan B Mukhtyar @cmukhtyar, Francis Berenbaum @larhumato, Meghna Jani @MeghnaJani, Martin Krusche @KruscheMartin and Yeliz Prior @YelizPrior

Acknowledgements We thank the Research Librarian Louise Falzon, UK.

Contributors AdT, CD, PB and AM contributed equally. AdT and CD (conveners) submitted the project with a contribution from TS (methodologist) to the EULAR executive committee. PB and AM were the research fellows on the project who carried out the systematic literature reviews, with the help of TS and YM and CM (co-methodologists). AdT and CD organised and chaired the online meetings. All authors contributed to the drafting of the points to consider at the online meetings and helped to revise the recommendations manuscript.

Funding MJ is funded by a National Institute for Health Research (NIHR) Advanced Fellowship [NIHR301413]. The project: 'Points to consider for remote care in rheumatic and musculoskeletal diseases (RMDs)' was funded by the European Alliance of Association for Rheumatology (EULAR). Project number CLI124

Disclaimer The views expressed in this publication are those of the author(s) and not necessarily those of the NIHR, NHS or the UK Department of Health and Social Care.

Competing interests AN has received consulting and/or speaker's fees from UCB, CHUGAI, BMS all unrelated to this manuscript. YM has received speakers fees from Pfizer unrelated to this manuscript. AdT has received an unrestricted grant from Novartis, and speakers fee from Pfizer and Eli Lilly unrelated to this manuscript. CD has received consulting/speaker's fees from Abbvie, Eli Lilly, Janssen, Novartis, Pfizer, Roche, Galapagos and Sanofi, all unrelated to this manuscript.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available. N/A.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

ORCID iDs

Annette de Thurah <http://orcid.org/0000-0003-0103-4328>
 Yvette Meissner <http://orcid.org/0000-0003-0147-4112>
 Chetan B Mukhtyar <http://orcid.org/0000-0002-9771-6667>
 Johannes Knitza <http://orcid.org/0000-0001-9695-0657>
 Aurélie Najm <http://orcid.org/0000-0002-6008-503X>
 Nina Østerås <http://orcid.org/0000-0001-8602-342X>

Francis Berenbaum <http://orcid.org/0000-0001-8252-7815>
 Meghna Jani <http://orcid.org/0000-0002-1487-277X>
 Martin Krusche <http://orcid.org/0000-0002-0582-7790>
 Silvia Piantoni <http://orcid.org/0000-0003-0913-0197>
 Christina Duftner <http://orcid.org/0000-0003-3137-8834>
 Yeliz Prior <http://orcid.org/0000-0001-9831-6254>
 Johannes WJ Bijlsma <http://orcid.org/0000-0002-0128-8451>
 Alen Zabotti <http://orcid.org/0000-0002-0573-464X>
 Tanja A Stamm <http://orcid.org/0000-0003-3073-7284>
 Christian Dejaco <http://orcid.org/0000-0002-0173-0668>

REFERENCES

- EULAR. RMD definition. Available: https://www.eular.org/myUploadData/files/rmd_definition_translation.pdf
- Safiri S, Kolahi AA, Hoy D, *et al*. Global, regional and national burden of rheumatoid arthritis 1990–2017: a systematic analysis of the global burden of disease study 2017. *Ann Rheum Dis* 2019;78:1463–71.
- Briggs AM, Cross MJ, Hoy DG, *et al*. Musculoskeletal health conditions represent a global threat to healthy aging: a report for the 2015 World Health organization world report on ageing and health. *Gerontologist* 2016;56 Suppl 2:S243–55.
- Krusche M, Sewerin P, Kleyer A, *et al*. [Specialist training quo vadis?]. *Z Rheumatol* 2019;78:692–7.
- Ward IM, Schmidt TW, Lappan C, *et al*. How critical is tele-medicine to the rheumatology workforce? *Arthritis Care Res* 2016;68:1387–9.
- Unger J, Putrik P, Buttgerit F, *et al*. Workforce requirements in rheumatology: a systematic literature review Informing the development of a workforce prediction risk of bias tool and the EULAR points to consider. *RMD Open* 2018;4:e000756.
- Dejaco C, Lackner A, Buttgerit F, *et al*. Rheumatology workforce planning in Western countries: a systematic literature review. *Arthritis Care Res* 2016;68:1874–82.
- WHO. Who guideline: recommendations on digital interventions for health system strengthening.
- Latifi R. Clinical Telemedicine Practice: From Ad hoc Medicine to Modus Operandi. In: Lafiti RD, Ronald CR, editor CM, eds. *Telemedicine, telehealth and Telepresence Principles, strategies, applications, and new directions*. Cham, Switzerland: Springer Nature, 2020: 43–9.
- Paré G, Moqadem K, Pineau G, *et al*. Clinical effects of home telemonitoring in the context of diabetes, asthma, heart failure and hypertension: a systematic review. *J Med Internet Res* 2010;12:e21.
- Dobkowski DS. Regina telehealth shift during COVID-19 pandemic shows capacity to safely deliver cardiology care, 2020. Department of Health and Human Services. Available: <https://www.hhs.gov/coronavirus/telehealth/index.html>
- Krusche M, Klemm P, Grahammer M, *et al*. Acceptance, usage, and barriers of electronic patient-reported outcomes among German rheumatologists: survey study. *JMIR Mhealth Uhealth* 2020;8:e18117.
- Webster P. Virtual health care in the era of COVID-19. *Lancet* 2020;395:1180–1.
- van der Heijde D, Aletaha D, Carmona L, *et al*. 2014 update of the EULAR standardised operating procedures for EULAR-endorsed recommendations. *Ann Rheum Dis* 2015;74:8–13.
- Munn Z, Peters MDJ, Stern C, *et al*. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol* 2018;18:143.
- Higgins JPT TJ, Chandler J. Cochrane Handbook for systematic reviews of interventions version 6.0 (updated July 2019), 2019. Cochrane. Available: www.training.cochrane.org/handbook
- Page MJ, McKenzie JE, Bossuyt PM, *et al*. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *PLoS Med* 2021;18:e1003583.
- Oxford centre of evidence based medicine, 2021. Available: <https://www.cebm.net/home/>
- Kulcsar Z, Albert D, Ercolano E, *et al*. Telerheumatology: a technology appropriate for virtually all. *Semin Arthritis Rheum* 2016;46:380–5.
- Virtual Assessment of Musculoskeletal conditions. How to set up a program to meet the needs of patients, 2021. Available: <http://boneandjointcanada.com/virtual-care/>
- van Velthoven MH, Wyatt JC, Meinert E, *et al*. How standards and user involvement can improve APP quality: a lifecycle approach. *Int J Med Inform* 2018;118:54–7.
- Greenhalgh T, A'Court C, Shaw S. Understanding heart failure; explaining telehealth - a hermeneutic systematic review. *BMC Cardiovasc Disord* 2017;17:156.
- Edelaar L, Nikiphorou E, Fragoulis GE, *et al*. 2019 EULAR recommendations for the generic core competences of health professionals in rheumatology. *Ann Rheum Dis* 2020;79:53–60.
- Carr ECJ, Ortiz MM, Patel JN, *et al*. Models of arthritis care: a Systems-level evaluation of acceptability as a dimension of quality of care. *J Rheumatol* 2020;47:1431–9.
- Nguyen-Oghalai TU, Hunter K, Lyon M. Telerheumatology: the Va experience. *South Med J* 2018;111:359–62.
- Gärtner M, Fabrizio JP, Koban E, *et al*. Immediate access rheumatology clinic: efficiency and outcomes. *Ann Rheum Dis* 2012;71:363–8.

- 27 Leggett P, Graham L, Steele K, *et al.* Telerheumatology—diagnostic accuracy and acceptability to patient, specialist, and general practitioner. *Br J Gen Pract* 2001;51:746–8.
- 28 Solomon DH, Iversen MD, Avorn J, *et al.* Osteoporosis telephonic intervention to improve medication regimen adherence: a large, pragmatic, randomized controlled trial. *Arch Intern Med* 2012;172:477–83.
- 29 Tso LS, Loi D, Mosley DG, *et al.* Evaluation of a nationwide pharmacist-led phone outreach program to improve osteoporosis management in older women with recently sustained fractures. *J Manag Care Spec Pharm* 2015;21:803–10.
- 30 Song Y, Reifsnider E, Zhao S, *et al.* A randomized controlled trial of the effects of a telehealth educational intervention on medication adherence and disease activity in rheumatoid arthritis patients. *J Adv Nurs* 2020;76:1172–81.
- 31 Smolen JS, Landewé R, Breedveld FC, Bijlsma JWJ, *et al.* EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs. *Ann Rheum Dis* 2010;69:964–75.
- 32 Aletaha D, Smolen JS. Diagnosis and management of rheumatoid arthritis: a review. *JAMA* 2018;320:1360–72.
- 33 Salaffi F, Carotti M, Ciapetti A, *et al.* Effectiveness of a telemonitoring intensive strategy in early rheumatoid arthritis: comparison with the conventional management approach. *BMC Musculoskelet Disord* 2016;17:146.
- 34 Smolen JS, Breedveld FC, Burmester GR, *et al.* Treating rheumatoid arthritis to target: 2014 update of the recommendations of an international task force. *Ann Rheum Dis* 2016;75:3–15.
- 35 Barber CEH, Mosher D, Dowling S, *et al.* Implementation and evaluation of audit and feedback for monitoring Treat-to-Target (T2T) strategies in rheumatoid arthritis using performance measures. *Rheumatol Ther* 2020;7:909–25.
- 36 de Thurah A, Stengaard-Pedersen K, Axelsen M, *et al.* Tele-Health followup strategy for tight control of disease activity in rheumatoid arthritis: results of a randomized controlled trial. *Arthritis Care Res* 2018;70:353–60.
- 37 Taylor-Gjevre R, Nair B, Bath B, *et al.* Addressing rural and remote access disparities for patients with inflammatory arthritis through video-conferencing and innovative inter-professional care models. *Musculoskeletal Care* 2018;16:90–5.
- 38 Gossec L, Cantagrel A, Soubrier M, *et al.* An e-health interactive self-assessment website (Sanoia[®]) in rheumatoid arthritis. A 12-month randomized controlled trial in 320 patients. *Joint Bone Spine* 2018;85:709–14.
- 39 Bennell KL, Campbell PK, Egerton T, *et al.* Telephone coaching to enhance a home-based physical activity program for knee osteoarthritis: a randomized clinical trial. *Arthritis Care Res* 2017;69:84–94.
- 40 Amorim AB, Pappas E, Simic M, *et al.* Integrating Mobile-health, health coaching, and physical activity to reduce the burden of chronic low back pain trial (impact): a pilot randomised controlled trial. *BMC Musculoskelet Disord* 2019;20:71.
- 41 Skrepnik N, Spitzer A, Altman R, *et al.* Assessing the impact of a novel smartphone application compared with standard follow-up on mobility of patients with knee osteoarthritis following treatment with Hylan G-F 20: a randomized controlled trial. *JMIR Mhealth Uhealth* 2017;5:e64.
- 42 Hinman RS, Campbell PK, Lawford BJ, *et al.* Does telephone-delivered exercise advice and support by physiotherapists improve pain and/or function in people with knee osteoarthritis? Telecare randomised controlled trial. *Br J Sports Med* 2020;54:790–7.
- 43 Kloek CJJ, Bossen D, Spreeuwenberg PM, *et al.* Effectiveness of a blended physical therapist intervention in people with hip osteoarthritis, knee osteoarthritis, or both: a cluster-randomized controlled trial. *Phys Ther* 2018;98:560–70.
- 44 Odole AC, Ojo OD. A Telephone-based physiotherapy intervention for patients with osteoarthritis of the knee. *Int J Telerehabil* 2013;5:11–20.
- 45 Bullock DR, Vehe RK, Zhang L, *et al.* Telemedicine and other care models in pediatric rheumatology: an exploratory study of parents' perceptions of barriers to care and care preferences. *Pediatr Rheumatol Online J* 2017;15:55.
- 46 Dejaco C, Alunno A, Bijlsma JW, *et al.* Influence of COVID-19 pandemic on decisions for the management of people with inflammatory rheumatic and musculoskeletal diseases: a survey among EULAR countries. *Ann Rheum Dis* 2021;80:518–26.
- 47 Ferucci ED, Holck P, Day GM, *et al.* Factors associated with use of telemedicine for follow-up of rheumatoid arthritis. *Arthritis Care Res* 2020;72:1404–9.
- 48 Ferwerda M, van Beugen S, van Burik A, *et al.* What patients think about e-health: patients' perspective on Internet-based cognitive behavioral treatment for patients with rheumatoid arthritis and psoriasis. *Clin Rheumatol* 2013;32:869–73.
- 49 Lawford BJ, Bennell KL, Kasza J, *et al.* Physical therapists' perceptions of Telephone- and Internet Video-Mediated service models for exercise management of people with osteoarthritis. *Arthritis Care Res* 2018;70:398–408.
- 50 Barber T, Sharif B, Teare S, *et al.* Qualitative study to elicit patients' and primary care physicians' perspectives on the use of a self-management mobile health application for knee osteoarthritis. *BMJ Open* 2019;9:e024016.
- 51 Knudsen LR, de Thurah A, Lomborg K. Experiences with telehealth followup in patients with rheumatoid arthritis: a qualitative interview study. *Arthritis Care Res* 2018;70:1366–72.
- 52 Opinc A, Łukasik Z, Makowska J. The attitude of Polish rheumatology patients towards telemedicine in the age of the COVID-19 pandemic. *Reumatologia* 2020;58:134–41.
- 53 Lawford BJ, Delany C, Bennell KL, *et al.* "I was really sceptical... But it worked really well": a qualitative study of patient perceptions of telephone-delivered exercise therapy by physiotherapists for people with knee osteoarthritis. *Osteoarthritis Cartilage* 2018;26:741–50.
- 54 Lawford BJ, Bennell KL, Hinman RS. Consumer perceptions of and willingness to use remotely delivered service models for exercise management of knee and hip osteoarthritis: a cross-sectional survey. *Arthritis Care Res* 2017;69:667–76.
- 55 Najm A, Nikiphorou E, Kostine M, *et al.* EULAR points to consider for the development, evaluation and implementation of mobile health applications aiding self-management in people living with rheumatic and musculoskeletal diseases. *RMD Open* 2019;5:e001014.
- 56 Cavagna L, Zanframundo G, Codullo V, *et al.* Telemedicine in rheumatology: a reliable approach beyond the pandemic. *Rheumatology* 2021;60:366–70.
- 57 Pers Y-M, Valsecchi V, Mura T, *et al.* A randomized prospective open-label controlled trial comparing the performance of a connected monitoring interface versus physical routine monitoring in patients with rheumatoid arthritis. *Rheumatology* 2021;60:1659–68.
- 58 Cuperus N, van den Hout WB, Hoogbeem TJ, *et al.* Cost-Utility and cost-effectiveness analyses of face-to-face versus Telephone-Based nonpharmacologic multidisciplinary treatments for patients with generalized osteoarthritis. *Arthritis Care Res* 2016;68:502–10.
- 59 Kloek CJJ, van Dongen JM, de Bakker DH, *et al.* Cost-effectiveness of a blended physiotherapy intervention compared to usual physiotherapy in patients with hip and/or knee osteoarthritis: a cluster randomized controlled trial. *BMC Public Health* 2018;18:1082.
- 60 Cuperus N, Hoogbeem TJ, Kersten CC, *et al.* Randomized trial of the effectiveness of a non-pharmacological multidisciplinary face-to-face treatment program on daily function compared to a telephone-based treatment program in patients with generalized osteoarthritis. *Osteoarthritis Cartilage* 2015;23:1267–75.
- 61 Berdal G, Bo I, Dager TN, *et al.* Structured goal planning and supportive telephone follow-up in rheumatology care: results from a pragmatic, Stepped-Wedge, cluster-randomized trial. *Arthritis Care Res* 2018;70:1576–86.
- 62 Hinman RS, Lawford BJ, Campbell PK, *et al.* Telephone-Delivered exercise advice and behavior change support by physical therapists for people with knee osteoarthritis: protocol for the Telecare randomized controlled trial. *Phys Ther* 2017;97:524–36.
- 63 Magnol M, Eleonore B, Claire R, *et al.* Use of eHealth by patients with rheumatoid arthritis: observational, cross-sectional, multicenter study. *J Med Internet Res* 2021;23:e19998.