

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

Annette de Thurah^{1, 2}, Philipp Bosch³, Andréa Marques^{4, 5}, Yvette Meissner⁶, Chetan B. Mukhtyar⁷, Alen Zabotti⁸, Johannes Knitza⁹, Aurélie Najm¹⁰, Nina Østerås¹¹, Tim Pelle¹², Line Raunsbæk Knudsen^{1, 2}, Hana Šmucrová¹³, Francis Berenbaum¹⁴, Meghna Jani¹⁵, Rinie Geenen¹⁶, Martin Krusche¹⁷, Polina Pchelnikova¹⁸, Savia de Souza¹⁹, Sara Badreh²⁰, Dieter Wiek²¹, Silvia Piantoni²², James M. Gwinnutt¹⁶, Christina Duftner²³, Helena Canhão²⁴, Luca Quartuccio⁸, Nikolay Stoilov²⁵, Yeliz Prior²⁶, Johannes Bijlsma²⁷, Tanja Stamm²⁸, Christian Dejaco^{29, 30}

Affiliations

- 1 Department of Rheumatology, Aarhus University Hospital, Denmark
- 2 Department of Clinical Medicine, Aarhus University, Denmark
- 3 Department of Rheumatology and Immunology, Medical University of Graz, Austria
- 4 Health Sciences Research Unit Nursing, Higher School of Nursing of Coimbra, Coimbra, Portugal
- 5 Rheumatology, Centro Hospitalar e Universitário de Coimbra EPE, Coimbra, Portugal
- 6 Epidemiology and Health Services Research, German Rheumatism Research Centre Berlin, Germany
- 7 Department of Rheumatology, Norfolk and Norwich University Hospital, Norwich, UK
- 8 Department of Medical and Biological Sciences, Institute of Rheumatology, University Hospital 'Santa Maria della Misericordia', 33100 Udine, Italy
- 9 Department of Internal Medicine 3, Friedrich-Alexander University (FAU) Erlangen-Nuremberg and Universitätsklinikum Erlangen, Ulmenweg 18, 91054 Erlangen, Germany
10. Institute of Infection, Immunity and Inflammation, College of Medical Veterinary and Life Sciences, University of Glasgow, Glasgow, United Kingdom.
- 11 National Advisory Unit on Rehabilitation in Rheumatology, Division of Rheumatology and Research, Diakonhjemmet Hospital, Oslo, Norway
- 12 Radboud University Medical Center, Department of Rheumatic Diseases, Nijmegen, the Netherlands. & Department of Rheumatology, Sint Maartenskliniek, Nijmegen, the Netherlands. & Radboud University Medical Center, Radboud Institute for Health Sciences, Department of Primary and Community Care.
- 13 Center of Medical Rehabilitation, Institute of Rheumatology, Praha, Czech Republic
- 14 Sorbonne University, INSERM UMRS_938 CRSA, AP-HP Saint-Antoine Hospital, Paris, France.
- 15 Centre 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
- 16 Department of Psychology, Utrecht University, Utrecht, the Netherlands
- 17 Division of Rheumatology and Systemic Inflammatory Diseases, University Hospital Hamburg-Eppendorf (UKE), Hamburg, Germany.
- 18 EULAR PARE Research Partner
- 19 Centre for Rheumatic Diseases, King's College London, London, UK
- 21 EULAR PARE Research Partner
- 22 Rheumatology and Clinical Immunology Unit, Department of Clinical and Experimental Sciences, ASST Spedali Civili and University of Brescia, Brescia (ITALY)
Health Science Centre, Manchester, UK
- 23 Medical University Innsbruck/Tirol Kliniken GmbH, Department of Internal Medicine, Clinical Division of Internal Medicine II, Innsbruck, Austria
- 24 EpiDoC Unit, Comprehensive Health Research Center, CEDOC, NOVA Medical School, UNL, Lisbon, Portugal
- 25 Faculty of Medicine, University Hospital St. Ivan Rilski, Medical University of Sofia, Sofia, Bulgaria

26 Centre for Health Sciences Research, School of Health and Society, University of Salford, United Kingdom

27 Department of Rheumatology and Clinical Immunology, University Medical Center Utrecht, The Netherlands

28 Section for Outcomes Research, Center for Medical Statistics, Informatics, and Intelligent Systems, Medical University of Vienna & Ludwig Boltzmann Institute for Arthritis and Rehabilitation, Vienna, Austria

29 Department of Rheumatology, Medical University Graz, Austria

30 Department of Rheumatology, Hospital of Bruneck (ASAA-SABES), Italy

Degree of each author:

Annette de Thurah: MPH, PhD

Philipp Bosch: MD

Andréa Marques: PhD

Yvette Meissner: PhD

Chetan Mukhtyar: MBBS, MSc, MD, FRCP, FRCP Edin

Alen Zabotti: MD, MSc

Johannes Knitza: MD, MHBA

Aurelie Najm: MD, PhD

Nina Østerås: PhD

Tim Pelle: PhD

Line Raunsbæk Knudsen, MCN

Francis Berenbaum: MD, PhD

Meghna Jani: MBChB MSc MRCP PhD FHEA

Rinie Geenen, PhD

Martin Krusche: MD

Savia de Souza: BSc (Hons), BDS

Sara Badreh: M.Sc.

Silvia Piantoni: MD PhD

James Gwinnutt: PhD

Christina Duftner: MD/PhD

Helena Canhao: MD, PhD

Luca Quartuccio: MD, PhD

Nikolay Stoilov: MD

Yeliz Prior, PhD

Johannes Bijlsma: MD, PhD

Tanja Stamm: PhD, Dr. rer. biol. hum., MSc, MBA, Mag. phil.,

Christian DeJaco: MD, PhD; MBA

ORCID (in alphabetical order)

Alen Zabotti :0000-0002-0573-464X

Andréa Marques: 0000- 0002- 2026- 9926

Annette de Thurah: 0045 2912 0722

Aurelie Najm: 0000-0002-6008-503X

Chetan Mukhtyar: 0000-0002-9771-6667

Christina Duftner: 0000-0003-3137-8834

Christian DeJaco: 0000-0002-0173-0668

Dieter Wiek: 0000-0002-8778-958X

Francis Berenbaum: 0000-0001-8252-7815

Helena Canhao: 0000-0003-1894-4870
James Gwinnutt: 0000-0002-1435-8797
Johannes Bijlsma: 0000 0002 0128 8451
Johannes Knitza:0000-0001-9695-0657
Line Raunsbæk Knudsen: 0000-0002-3176-6207
Luca Quartuccio: 0000-0002-0134-6439
Martin Krusche:0000-0002-0582-7790
Meghna Jani: 0000-0002-1487-277X
Nina Østerås:0000-0001-8602-342X
Philipp Bosch: 0000-0002-6783-6422
Polina Pchelnikova: 0000-0003-4523-4831
Rinie Geenen: 0000-0002-6615-6708
Sara Badreh: 0000-0002-0266-2089
Savia de Souza: 0000-0003-4953-3257
Silvia Piantoni: 0000-0003-0913-0197
Tanja Stamm: 0000-0003-3073-7284
Tim Pelle: <https://orcid.org/0000-0001-6862-5910>
Yeliz Prior: 0000-0001-9831-6254
Yvette Meissner: 0000-0003-0147-4112

Corresponding author

Professor Annette de Thurah, MPH, PhD
Department of Rheumatology, Aarhus University Hospital, Denmark &
Department of Clinical Medicine, Aarhus University, Denmark
Palle Juul-Jensens Boulevard 99
8240 Aarhus N, Denmark
annethur@rm.dk
ORCID: 0045 2912 0722

Word count: 2989

Tables: 2

Abstract

Background

Remote care and telehealth have the potential to expand health care 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, prioritization 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 pre-assessment 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.

Keywords Telehealth, epidemiology research, health services research, remote care, virtual medicine

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 RMD.
- They cover several aspects including screening for RMD, pre-assessment 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 clinical practice?

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

1 Introduction

2 The prevalence of rheumatic and musculoskeletal diseases¹ (RMD) in developed countries has
3 increased by 60% from 1990 to 2010 and is expected to continue rising. An aging population, earlier
4 diagnosis, and improved survival among people with RMD are the main reasons for the increased
5 prevalence.[2, 3] Compounded by a relative drop in the number of rheumatologists [4] and other
6 health care providers (HCPs), the pressure on the healthcare system has increased.[5, 6] Waiting
7 times for a new or follow-up rheumatology appointment have grown, hampering implementation of
8 guidelines for good clinical care.[7] Alternative forms of care using telehealth for follow-up of people
9 with RMD, and for self-management interventions may preserve and even improve quality of care.
10 Remote care makes use of digital technologies – so-called ‘telehealth’ interventions.[8] It is used in
11 all parts of the patient pathway, including communication with patients/caregivers, disease
12 screening or monitoring of different aspects of the disease (e.g., disease activity, damage, quality of
13 life, adherence, etc.). It can be delivered synchronously (HCP and patient being present at the same
14 time) or asynchronously, and be divided into three main types of modalities: *Live video*
15 (synchronous), and the asynchronous modalities: *Store and forward* (transmission of recorded
16 health history) and *Remote patient monitoring*.[9]
17 Telehealth can improve healthcare access and outcomes, particularly in the treatment of chronic
18 diseases.[10] It can reduce demands on overstretched facilities and make the health sector more
19 resilient,[8] and has become even more relevant during the COVID-19 pandemic when it has been
20 difficult to deliver face-to-face care and investigations as usual.[11, 12] Further, the COVID-19
21 pandemic has resulted in wider use of telehealth services, and remote care has become much more
22 socially acceptable.[13]
23 However, guidance is needed on how telehealth should be integrated into routine clinical care.
24 The aim of this EULAR task force (TF) was to formulate points to consider (PtC) for the development,
25 prioritization and implementation of remote care and telehealth for people with RMD. The target
26 users are people with RMD and their relatives, physicians and other HCPs involved in the care of
27 people with RMD, regulators and policy makers.

28 In the context of these PtC and following the definition of the WHO, telehealth was defined as: ‘the
29 use of telecommunications and virtual technology to deliver healthcare outside of traditional
30 healthcare facilities’.[8] Remote care was defined as ‘the provision of care using telehealth and

¹: ‘A diverse group of diseases that commonly affect the joints, but can also affect the muscles, other tissues and internal organs’.¹ EULAR. RMD Definition [Available from: https://www.eular.org/myUploadData/files/rmd_definition_translation.pdf.

1 virtual technology allowing patients to be evaluated, monitored and possibly treated while the
2 patient and HCP are physically remote from each other’.

3

4 **Methods**

5 This work was developed using the 2014 updated EULAR standardised operating procedures.[14]
6 After approval from the EULAR Executive Committee, the conveners (AdT and CD) and fellows (PB
7 and AM) formed an international TF representing 14 European countries. TF members included one
8 methodologist and two co-methodologists (TS, CM and YM), rheumatologists (including one
9 representative from EMEUNET), one epidemiologist (also representing EMEUNET), health
10 professionals in rheumatology (HPRs) (nurses, occupational therapists, physiotherapists and one
11 psychologist) and four people with RMD. In preparation for the application of this project to EULAR,
12 a broad scoping review (Supplementary Appendix 1) was undertaken to map the current research
13 and knowledge gaps within remote care interventions in rheumatology. A scoping review does not
14 aim to produce a critically appraised and synthesised result nor to answer a particular question, but
15 rather to provide an overview of the evidence for this topic.[15] As such, the scoping review was
16 presented at the first task force meeting and informed the outlined research questions and the
17 search strategy in the systematic literature review (SLR):

18 what is the efficacy, safety, cost-effectiveness, user perception and adherence of remote care or
19 blended care as compared to standard care in people with RMD? How is remote care
20 delivered/tailored to people with RMD and integrated into clinical practice? What are the drivers
21 and barriers for implementation of remote care in clinical practice? These questions were
22 transformed into the PICO (Population, Intervention, Comparator, Outcome) format, driving the
23 development of the search strategy for the SLR. The SLR was conducted by the two fellows under
24 the guidance of the methodologist and two co-methodologists in accordance with the Cochrane
25 Handbook.[16] The results of the SLR were reported in accordance with the Preferred Reporting
26 Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines,[17] and have been published
27 separately.

28 The two TF meetings were held via a virtual online platform. During the first meeting in November
29 2020, definitions for remote care and telehealth were discussed and the key questions were
30 phrased.

31 During the second virtual meeting, held in April 2021, the TF members formulated the overarching
32 principles and PtC based on evidence from the SLR and expert opinion, through a nominal group
33 process. Consensus was accepted in the first-round if >75% of the members voted in favour of a
34 statement. As all statements were accepted in the first round, no additional rounds were necessary.

1 Finally, each TF member anonymously indicated their level of agreement (LoA) to each statement
2 using Survey Monkey® (LoA, 0-10 numeric rating scale ranging from 0 =”completely disagree” to 10 =
3 ”completely agree”). The mean and standard deviation of the LoA, as well as the percentage of TF
4 members with an agreement ≥ 8 are presented. The Level of Evidence (LoE) was assigned to each
5 statement based on the standards of the Oxford Centre for Evidence Based Medicine.[18]
6 Finally, a research agenda was formulated based on evidence gaps and controversial points. The
7 final manuscript was reviewed and approved by all TF members and the EULAR Council.

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

Overarching principles	LoE¹	LoA²
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. ³	9.7 (0.7) 96.6% ≥ 8
B. Remote care ³ 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 ⁴ 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 prioritization 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, nonsteroidal anti-inflammatory drugs (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

1: LoE, level of evidence; 2: LoA, level of agreement (mean (SD)); 3: 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; 4: telehealth: the use of telecommunications and virtual technology to deliver healthcare outside of traditional healthcare facilities

1 **Results**

2 **Overarching principles**

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

6

7 **A. Tailored care combining remote and face-to-face attendance should be based on shared** 8 **decision making as well as the needs and preferences of people with RMD.**

9 The decision on using remote care should be tailored to the patient's needs and preferences
10 including demographic, social situation, geographical access to healthcare, employment status,
11 specific diagnosis, comorbidities, disease phase and status. i.e., in a newly onset rheumatoid arthritis
12 (RA), a face-to-face visit should be performed, but telehealth may be optimal for education about
13 disease symptoms, disease activity, therapy, and self-management. Patients with a well-established
14 diagnosis, stable disease activity and less complex diseases can be offered use of telehealth
15 solutions.[19] Patients with long-standing, stable RA might require less education and training and
16 their treatment might not need modification. Some of these patients may prefer telehealth
17 consultations rather than hospital visits. Similarly, a younger patient in full-time employment living
18 far away from the hospital might prefer telehealth, whereas an elderly patient living nearby and with
19 limited access to technology might opt for a face-to-face visit.

20 **B. Remote care for people with RMD can be delivered by all members of the healthcare team** 21 **using a variety of telehealth techniques.**

22 As can be seen in Supplementary Table 1, telehealth makes use of different types of technology and
23 modalities. Not all services in the RMD care pathway can be delivered remotely; but allowing for
24 security, feasibility and need, all members of the healthcare team can deliver them. Different
25 services are offered by different HCPs. Interventions within diagnostics, for example, are usually
26 delivered by physicians; whereas interventions on training and exercise are mostly managed by
27 physiotherapists. Monitoring of disease activity, rehabilitation and self-management interventions
28 may involve different HCPs (Supplementary Table 1).

29 **C. Telehealth interventions should be developed in collaboration with all stakeholders including** 30 **the healthcare team, caregivers and people with RMD.**

31 User involvement by all stakeholders (e.g., patients, carers, HCPs, and decision makers) are believed
32 to be important in order to overcome usability issues of telehealth solutions.[20, 21] Patients are at
33 the centre of this process, and the goal is to develop user-friendly, intuitive and effective technology

1 that helps to improve healthcare services from a patient’s perspective. It is essential to include HCPs
2 in order to reflect daily clinical practice, i.e. by letting them propose which intervention can be
3 delivered remotely and how technology could be incorporated into the overall clinical evaluation
4 and workflow. The involvement of administration personnel and funding bodies is required to
5 guarantee reimbursement of services and to prevent additional bureaucracy to HCPs and patients.

6 **D. Members of the healthcare team involved in remote care interventions should have adequate**
7 **equipment and training, as well as telecommunication skills.**

8 Successful telehealth interventions require that the healthcare team receives training in telehealth
9 communication, interaction, legacy and clinical assessment.[22] Despite great interest, HCPs often
10 are unaware of available telehealth tools,[12] and should take responsibility for their ongoing
11 professional development,[23] but health care organizations are also responsible for preparing the
12 workforce for telehealth-based clinical practice.[22] In future, telehealth should be incorporated into
13 the existing curricula at universities and other healthcare educational institutions so that HCPs can
14 develop the skills to provide safe and competent telehealth care.

15

16 **PtC 1: Pre-assessment by telehealth may be considered to improve the referral process to**
17 **rheumatology and help prioritization of people with suspected RMD.**

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

27

28 **PtC 2: Telehealth may assist pre-diagnostic processes for RMD; however, diagnosis should be**
29 **established in a face-to-face visit.**

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

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

10

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

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

21

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

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

33

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

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

8 The SLR identified two randomized controlled trials (RCTs) indicating that in patients with sustained
9 remission, telehealth follow-up resulted in similar outcomes including disease activity, physical
10 function and quality of life compared with regular face-to-face visits.[36, 37]

11

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

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

20

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

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

31

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

1 Telehealth has the potential to provide access to resources and care, increase flexibility, and reduce
 2 waiting lists and patient travel time. However, some barriers that might obstruct successful
 3 implementation of telehealth must be assessed systematically.[30, 41, 45-52]
 4 In Table 2, we depict a list of possible barriers identified in the SLR and by the TF members and
 5 provide suggestions on how these barriers could be resolved. This list is not exhaustive but may form
 6 the basis for the development of local checklists enabling implementation of telehealth into clinical
 7 practice.

8 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, 53] Varying digital and health literacy skills [46, 47, 51, 54] Lack of access to necessary equipment [46, 55]	<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, 56] Disease burden, medical and psychological comorbidity [45, 53]	<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.
Organizational factors	Lack of data security [51, 55] 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.

9

10

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

12 Training of members of the healthcare team in telehealth techniques and communication skills was
 13 seen as an overarching principle; however, the TF agreed that a separate statement was needed on
 14 training people with RMD in using telehealth. Many of the included surveys and qualitative studies
 15 refer to problems with digital literacy.[46, 52, 54, 55] People with RMD should be offered training in

1 using telehealth solutions and should be informed how to prepare for a telehealth consultation (e.g.,
2 by having questions prepared, sitting in a quiet place, etc.). Any member of the healthcare team,
3 depending on the local setting, can offer this training.

4

5 Based on the discussions and the areas of uncertainty, a research agenda has been proposed which
6 is depicted in Box 1.

7

8 Box 1. Research agenda

9

Remote care in RMD - identified unmet needs and suggested focus for future research:

10

- To conduct randomised non-inferiority and superiority trials to test the efficacy and patient satisfaction of telehealth interventions as compared to conventional care.

11

12

- To perform longitudinal studies to test if telehealth leads to more or less treatment changes.

13

- To evaluate methods of pre-assessment and prioritization within different settings and diseases.

14

- To evaluate the cost-effectiveness of telehealth interventions.

15

- To explore factors associated with digital health literacy (for both, people with RMD and HCPs)

16

- To explore barriers to the implementation of telehealth and how they can be solved.

17

- To explore how artificial intelligence can be integrated into telehealth interventions in order to support the development of knowledge of clinical processes.

18

19

- To evaluate patient safety and data security when using telehealth in daily clinical practice and in an extended follow-up.

20

1 **Discussion**

2 The current paper presents the first EULAR PtC on the use of telehealth in daily clinical rheumatology
3 practise. These PtC can be used to inform and guide the development of national recommendations
4 and local telehealth solution and complement previous EULAR PtC for the development, evaluation
5 and implementation of mobile health application aiding self-management of people with RMD.[57]
6 Within rheumatology, telehealth has been discussed in the context of the increasing prevalence of
7 RMD, and workforce limitations.[2, 6] Recently, the COVID-19 pandemic has made telehealth even
8 more relevant with 78% of patients finding it acceptable.[58] A recent EULAR survey conducted in 35
9 countries showed that during the pandemic, the majority of European face-to-face consultations
10 were converted into telehealth consultations.[46] However, that study also pointed out that more
11 research within tele-rheumatology is needed.[46]

12 As this is a relatively new research area, the present PtC are only partially supported by evidence.
13 Furthermore, few of the studies addressed disease monitoring in inflammatory arthritis.[33, 36, 37,
14 59] PtC 8 (barriers) and 9 (training of people with RMD) are mainly based on qualitative research
15 that is considered low quality of evidence by the Oxford hierarchy.[18] This does, however, not
16 indicate a lower importance of these PtC.

17 Telehealth has been promoted as a means to increase cost-effectiveness, but this was only
18 addressed in two studies on remote physiotherapy,[60, 61] revealing conflicting results.
19 Furthermore, in some studies telehealth interventions were applied as an add-on to and not as a
20 replacement of face-to-face contact.[41, 42, 62, 63] This makes a direct comparison between
21 telehealth and face-to-face interventions difficult.

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

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

32
33
34

1 **Competing interests:**

2 AN has received consulting and/or speaker's fees from UCB, CHUGAI, BMS all unrelated to this
3 manuscript.

4 YM has received speakers fees from Pfizer unrelated to this manuscript.

5 AdT has received an unrestricted grant from Novartis, and speakers fee from Pfizer and Eli Lilly
6 unrelated to this manuscript

7 CD has received consulting/speaker's fees from Abbvie, Eli Lilly, Janssen, Novartis, Pfizer, Roche,
8 Galapagos and Sanofi, all unrelated to this manuscript

9 **Contributorship:** All authors are members of the EULAR's task force on points to consider for the for
10 remote care in rheumatic and musculoskeletal diseases. AM and PB were the fellows. AT and CD were
11 the convenors. TS was the methodologist and YM and CM the co-methodologists. All authors have
12 contributed to the work, read and finally approved the manuscript for submission.

13 **Acknowledgements:** We thank the Research Librarian Louise Falzon, UK.

14 MJ is funded by a National Institute for Health Research (NIHR) Advanced Fellowship [NIHR301413].

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

17 **Funding:** The project: "Points to consider for remote care in rheumatic and musculoskeletal
18 diseases (RMDs)" was funded by the European Alliance of Association for Rheumatology (EULAR).
19 Project number CLI124.

20 **Ethical approval information:** None or not applicable.

21

22

23

References

1. EULAR. RMD Definition [Available from: https://www.eular.org/myUploadData/files/rmd_definition_translation.pdf].
2. 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(11):1463-71.
3. 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.
4. Krusche M, Sewerin P, Kleyer A, et al. [Specialist training quo vadis?]. *Z Rheumatol*. 2019;78(8):692-7.
5. Ward IM, Schmidt TW, Lappan C, et al. How Critical is Tele-Medicine to the Rheumatology Workforce? *Arthritis Care Res (Hoboken)*. 2016;68(10):1387-9.
6. Unger J, Putrik P, Buttgereit 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(2):e000756.
7. Dejaco C, Lackner A, Buttgereit F, et al. Rheumatology Workforce Planning in Western Countries: A Systematic Literature Review. *Arthritis Care Res (Hoboken)*. 2016;68(12):1874-82.
8. WHO. WHO Guideline: recommendations on digital interventions for health system strengthening. Report No.: ISBN: 978-92-4-155050-5.
9. Latifi R. Clinical Telemedicine Practice: From Ad hoc Medicine to Modus Operandi. In: Lafiti RD, C.R, Ronald, C.M, editor. *Telemedicine, Telehealth and Telepresence Principles, Strategies, Applications, and New Directions*. Cham, Switzerland: Springer Nature; 2020. p. 43-9.
10. Pare 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(2):e21.
11. Dobkowski DS, Regina Telehealth shift during COVID-19 pandemic shows capacity to safely deliver cardiology care: Department of Health and Human Services; 2020 [Available from: <https://www.hhs.gov/coronavirus/telehealth/index.html>].
12. 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(7):e18117.
13. Webster P. Virtual health care in the era of COVID-19. *Lancet*. 2020;395(10231):1180-1.
14. 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(1):8-13.
15. 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(1):143.
16. Higgins JPT TJ, Chandler J. *Cochrane Handbook for systematic reviews of interventions version 6.0 (updated July 2019)*: cochrane; 2019. . [Available from: Available: www.training.cochrane.org/handbook].
17. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *PLoS Med*. 2021;18(3):e1003583.
18. Oxford Centre of Evidence Based medicine 2021 [Available from: Available on: <https://www.cebm.net/home/>].
19. Kulcsar Z, Albert D, Ercolano E, et al. Telerheumatology: A technology appropriate for virtually all. *Semin Arthritis Rheum*. 2016;46(3):380-5.

20. Virtual Assessment of Musculoskeletal conditions. How to set up a program to meet the needs of patients. 2021 [Available from: <http://boneandjointcanada.com/virtual-care/>].
21. 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.
22. Greenhalgh T, A'Court C, Shaw S. Understanding heart failure; explaining telehealth - a hermeneutic systematic review. *BMC Cardiovasc Disord.* 2017;17(1):156.
23. 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(1):53-60.
24. 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(9):1431-9.
25. Nguyen-Oghalai TU, Hunter K, Lyon M. Telerheumatology: The VA Experience. *South Med J.* 2018;111(6):359-62.
26. Gartner M, Fabrizio JP, Koban E, et al. Immediate access rheumatology clinic: efficiency and outcomes. *Ann Rheum Dis.* 2012;71(3):363-8.
27. Leggett P, Graham L, Steele K, et al. Telerheumatology--diagnostic accuracy and acceptability to patient, specialist, and general practitioner. *The British journal of general practice : the journal of the Royal College of General Practitioners.* 2001;51(470):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(6):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. *Journal of managed care & specialty pharmacy.* 2015;21(9):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(5):1172-81.
31. Smolen JS, Landewe RBM, Bijlsma JWJ, et al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2019 update. *Ann Rheum Dis.* 2020.
32. Aletaha D, Smolen JS. Diagnosis and Management of Rheumatoid Arthritis: A Review. *JAMA.* 2018;320(13):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(1):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(4):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 (Hoboken).* 2018;70(3):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(1):90-5.
38. Gossec L, Cantagrel A, Soubrier M, et al. An e-health interactive self-assessment website (Sanoia((R))) in rheumatoid arthritis. A 12-month randomized controlled trial in 320 patients. *Joint Bone Spine.* 2018;85(6):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 (Hoboken).* 2017;69(1):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(1):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(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*. 2019.
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(7):560-70.
44. Odole AC, Ojo OD. A Telephone-based Physiotherapy Intervention for Patients with Osteoarthritis of the Knee. *Int J Telerehabil*. 2013;5(2):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(1):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*. 2020.
47. Ferucci ED, Holck P, Day GM, et al. Factors Associated With Use of Telemedicine for Follow-up of Rheumatoid Arthritis. *Arthritis Care Res (Hoboken)*. 2020;72(10):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(6):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 (Hoboken)*. 2018;70(3):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(1):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 (Hoboken)*. 2018;70(9):1366-72.
52. Opinc A, Lukasik Z, Makowska J. The attitude of Polish rheumatology patients towards telemedicine in the age of the COVID-19 pandemic. *Reumatologia*. 2020;58(3):134-41.
53. 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(5):524-36.
54. 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(6):741-50.
55. 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 (Hoboken)*. 2017;69(5):667-76.
56. 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(1):e19998.
57. 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(2):e001014.

58. Cavagna L, Zanframundo G, Codullo V, et al. Telemedicine in rheumatology: a reliable approach beyond the pandemic. *Rheumatology (Oxford)*. 2021;60(1):366-70.
59. Pers YM, 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 (Oxford)*. 2021;60(4):1659-68.
60. Cuperus N, van den Hout WB, Hoogeboom 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 (Hoboken)*. 2016;68(4):502-10.
61. 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(1):1082.
62. Cuperus N, Hoogeboom 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(8):1267-75.
63. 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 (Hoboken)*. 2018;70(11):1576-86.