

Supplemental Table 1: Article Summaries

Reference	# of Patients	Type of Disorder	Study duration	Outcome Measures	Results	Level of Evidence
Patient Telehealth Suitability						
11 (Giacobbe)*	102	General Rheumatology	21-Oct	Acceptability of telemedicine for first visit. Number of additional exams prescribed, and number of definite diagnoses at first visit in the TM group compared to regular visit group.	Lower number of blood exams 14% $p<0.005$, lower number of instrumental exams 25% $p=0.04$, and a higher percentage of definitive diagnosis 79% $p=0.2$ for patients in the TM group compared to F2F care.	Cohort (prospective)
12 (Leverenz)*	114 patient-physician encounters	Undefined	January-December 2021	Concordance between providers and predictive model for the appropriateness of a telehealth or F2F visit.	Providers accepted 37/56 (66%) of true predicted changes compared to 11/58 (19%) of the fake predictions. Cohen's kappa of 0.4722 (moderate agreement), $p<0.001$. 17/22 (77%) of patients offered a change agreed.	Cohort (prospective)

13 (English)	100	Low Trauma Fracture	Undefined	Risk factors, demographics, fracture type, FRAX scores	Virtual fracture liaison clinics were effective in the clinical management and risk assessment of fractures. 90% of patients rated their experience as very good to excellent.	Retrospective
14 (Sloan)	1340	IA, Lupus, Sjogrens, SSc	April-July 2021	Responses to TM experience	Patients and providers preferred F2F instead of TM overall. Increased misdiagnoses, inequalities and barriers to accessing care are drawbacks of TM.	Retrospective
15 (Zhu)	3,040	IA, CTD, Vasculitis	April-May 2019, April-May 2020	Ability to make a diagnosis and change in immunosuppression between the F2F and TM cohort.	TM associated with diagnostic delay and lower likelihood of changing an immunosuppressive therapy.	Retrospective
16 (Singh)	143 providers	Undefined	November 2020-January 2021	Responses to provider TM experience	High provider resilience was associated with better quality clinical video TM. VA providers became more comfortable with TM for established, but not new, patients.	Retrospective

17 (Bruera)*	157	SLE	September-November 2019, 2020	Missed clinic visit appointments, successful laboratory testing utilization between F2F visits vs TM visits.	No show rate for F2F visits in 2020 was 16.2% vs. 5.5% for TM (p=0.002). TM visits associated with increased utilization (97.3%) of urine tests compared to F2F visits (86.9%), p<0.001. Utilization of other lab studies was similar for both groups.	Retrospective
Barriers to Telemedicine						
18 (Sandhu)	7577	RA	March-June 2020	mHAQ, telephone interview answers	TM decreases the time and reduces financial burden on patients. For rural patients, text message communication may help to overcome language barrier.	Cohort (prospective)
19 (Kavadichanda)	373	SLE, IA	20-Apr	Assessment of disease status, socioeconomic status, and economic impact of Covid to identify barriers in accessing care during the crisis.	Socioeconomically marginalized patients with RMD accept TM. Switching to TM based model may help improve drug adherence and save on F2F visit costs.	Retrospective
20 (Takahashi)	119	KOA	April-June 2020	Survey responses to identify willingness of patients to use TM	Older age and lack of smartphone ownership is a barrier to TM.	Retrospective

21 (Raizada)	336	RA, PsA, CTD	May-June 2020	Survey responses	Most patients were satisfied with telephone consults. Older patients in favor of F2F care. For urgent advice, TM is preferred.	Retrospective
22 (Bos)	75 providers	Undefined	20-May	Responses to TM experience	Less travel time, ease of use, and shorter waiting time were pros of TM. Inability to perform PE and technologic barriers were cons of TM.	Retrospective
Use of Clinical Disease Activity Measures and Patient Reported Outcomes						
23 (Haaversen)*	212	RA	May-June 2020	Self-reported RAPID3 scores. If >6, were verified by rheumatologists to see if a clinical flare was present.	TM follow-up had significantly higher flare rate than the OC-follow up on RAPID-3, but not clinical flares. Authors indicated that flares were due to non-RA pain and other factors.	RCT

24 (Moreno)	218	RA	July-October 2020	Bivariate analysis of activity of disease, quality of life, disability, therapeutic adherence, and self-care ability for patients in TM, F2F, or TR. Measures: PGA, PtGA, RAPID3, DAS28, EQ-5, MGLS, ASAS-R.	TM was as effective as F2F in controlling RA levels. Qualitative analysis supports mixed care model that enables the patient and healthcare provider to determine which method is best suited.	Cohort (prospective)
25 (So)*	141	Lupus Nephritis	May 2020-2021	Percentage of patients with a low disease activity at 1 year in TM and outpatient FU group. Outcomes measured: SLEDAI-2K, PGA, lab measures, SF-36, Lupus QoL, HADS *SLEDAI-2K was measured even for telehealth visits, even though such assessments haven't been validated for telehealth purposes	Similar proportion of TM and FU patients were in Lupus low-disease activity state or remission after 1 year. Disease activity was also similar between the groups, though more TM patients requested a change to F2F visits.	RCT
26 (Eong)	435	SLE	February 2020-2021	SLEDAI-2K, SDI	Subsequent SLE activity was similar between TM and F2F patients.	Cohort (prospective)
27 (Piga)	106	RA, PsA, SLE	March-June 2020	Sensitivity and specificity of TM. ICC for TM measured disease activity and PROs	In 89/106 patients (84%), F2F visits confirmed the remotely delivered treatment decision. Video visiting had an excellent sensitivity (94.1% with 95% CI: 73.1-99.9%) and excellent specificity (96.7% with 95% CI: 90.8-99.3%) in	Cohort (prospective)

					finding a need for adjusting the treatment of a patient due to inadequate disease control.	
28 (Chevallard)	431	RA, PsA, AS	January - March 2020, June -August 2020	GH, VAS pain	No significant difference in GH and VAS in the TM vs. F2F visit for RA, PsA, or AS patients.	Retrospective
29 (Naveen)	22	IIM	January-March 2021	Ten times arm lift test and two-minute walk distance results	Arm lift test had a strong test-retest reliability and discriminant validity in patients with IIM unlike 2-minute walk distance. Arm lift test can be a PRO for IIM patients in TM care.	Cohort (prospective)
Measures of Telehealth Satisfaction						
30 (Tang)	100 patients/17 providers	SLE, RA, UCTD	April-September 2020, October 2021-January 2022	7 item satisfaction questionnaires	High level of satisfaction with TM for patients. Technical difficulties and lack of physical exam were reasons of dissatisfaction for providers.	Cohort (prospective)
31 (Danila)	819	RA, PsA, AS	June-August 2020	Cross-sectional survey about telemedicine covering access, satisfaction, perceptions, and future preference.	Overall patient satisfaction with TM was high (7.3/10). Patients prefer TM for routine visits, reviewing test results, considering medication change, and when starting a new injection.	Retrospective

32 (Hall)	12	Undefined	June-July 2020	Telephone interviews with patients and providers with qualitative analysis.	Majority of the patients viewed TM visits positively. Most patients reported no technological issues during their visits. Patients also felt that TM was a sufficient option for those experiencing critical issues.	Retrospective
33 (Mortezavi)	679	RA, OA, lupus, PsA	5/1/2020-5/29/2020	Likert scale response to satisfaction. Patient preference for F2F visit vs. TM consult.	Majority of patients were satisfied with TM but preferred a video form over phone. They preferred an F2F visit if it was the first meeting with the doctor. Inability to have physical exam was main concern.	Retrospective
34 (Suliman)*	50	SSc, RA	Undefined	MD global assessment, Pain VAS, and questionnaire.	Older age groups were associated with higher difficulty using TM ($p=0.0059$). Patients with higher disease activity (MD global) reported more difficulties using technology during their TM visit ($p=0.027$).	Retrospective

35 (Tarvin)*	99	JM	February-May 2022	Redcap survey with quantitative and qualitative analysis of responses regarding attitudes towards TM.	Concerns expressed regarding the thoroughness of assessment during TM visits for both patients and providers. There is a role for TM in the future for JM patients that would benefit from improved remote assessment tools.	Retrospective
36 (Adams)	128	RA, CTD, OA	March-April 2020	Modified Telemedicine Satisfaction and Usefulness Survey a validated TM satisfaction survey	Older patients lacking internet access and educational qualifications were dissatisfied with TM. Concerns of TM included absence of physical exam. Patients like idea of mixed-model clinic.	Cohort (prospective)
37 (Oh)	494	Undefined	April-May 2020	30 item questionnaire including Likert scale responses regarding patient experience.	More than 70% of responses indicated overall satisfaction with TM care. Cost-effectiveness and time saved at work were benefits of TM use.	Retrospective
38 (Jones)	297	General Rheumatology	June-July 2020	30 item questionnaire consisting of single and Likert scale responses regarding patient experience and perceptions.	Overall, patients were satisfied with TM consults. Older patients were more dissatisfied with TM use.	Retrospective

39 (Byravan)	784	Undefined	May-September 2020	Online patient survey about TM experience	New patients expressed surprise at how thorough their TM visit was. 94% of patients stated their visit was either good or very good. Patients were dissatisfied with the timing of the visits.	Retrospective
40 (Staszewski)*	212 procedures	Undefined	October 2019-January 2022	Provider and patient satisfaction questionnaire	97% of patients wanted to continue use of the TM treatment. 100% of the rheumatologists wanted to incorporate TM into their care.	Retrospective
41 (Ramachandran)*	39	RA	December 2020-2021	Semi-structures interviews with RA patients recording the experiences of individuals with RA accessing TM and F2F care.	Patients preferred TM in some situations (ex. Avoid travelling) and F2F in other situations (ex. Ease of explaining symptoms). Ultimately, patients want a choice between the two.	Retrospective
42 (Howren)	429	RA, OA, PsA	April-June 2020	International survey in English and French	Disease severity and TM satisfaction were strongly correlated. Higher satisfaction among patients under control (19.3% vs. 4.5%) and with severe disease (11.9% vs. 4.5%) and lower satisfaction among	Retrospective

					patients with mild (27.5% vs. 43.5%) and moderate disease (41.3% vs. 47.7%).	
43 (Haegens)*	15	Undefined	May-June 2021	Semi-structured interviews with patients utilizing hypothetical questions and assessing attitudes towards TM.	TM services are influenced by patient related (literacy, skills with digital applications), application related (level of interaction, extent of privacy), and context related factors (support from healthcare workers in using TM applications, reliability of source information).	Retrospective
Articles Critiques in Discussion						
44 (Matsumoto)	20 included studies	RMDs	Studies included from 2018-2020	Studies that described efficacy and perception of TM care, along with associated drivers and barriers	Vulnerable patients still lack the resources for a TM visit. Focus should be placed on health equity and the digital divide as TM continues to grow.	Scoping Review
45 (England)	Undefined	RA	Undefined	CDAI, DAS28, PAS-II, SDAI, RAPID3, HAQ-II, MDHAQ, PROMIS	The ACR recommended RA disease activity and functional status measures can be utilized for TM purposes.	Brief Report

46 (Shenoi)	Undefined	RMDs	Undefined	Practical considerations for physicians to incorporate video TM in pediatric rheumatology.	Variation of the validated pGALS called the video pGALS was shown to be promising, but more research needs to be done to validate the quality of such methods moving forward.	Brief Report
47 (Stinson)	19	JIA	Undefined	Performance and satisfaction of a self-management online portal for children with JIA	Participants felt that the functionality of the online portal allowed them to address their personalized pain and chronic health condition.	Retrospective
48 (Seppen)	69	RA	4 weeks	Satisfaction among users of a mobile app for self-management of RA	Satisfaction and usability of the app were high among patients. Over time, however, usage with the app after the 4-week study period dropped off.	Cohort (prospective)
49 (Kuusalo)	166	RA	August 2013-July 2015	Boolean remissions (46 joint count), C-reactive protein, SF-36, VAS, number of office visits, number of telephone contacts	Text-message enhanced monitoring does not significantly enhance remission rates in patients with early RA.	RCT
50 (Pers)	89	RA	April 2017-August 2019	Number of physical visits between baseline and 6-months, DAS28, RAPID3, HAQ, SF-12	Telemedicine monitoring of RA patients starting a new treatment reduces number of physical visits, controls disease activity, and	RCT

					improves quality of life.	
51 (Lee)	191	RA	November 2016-May 2018	TSQM, PEPPI, CDAI	Mobile app intervention did not significantly improve patient satisfaction or disease activity compared to in-person care.	RCT
52 (De Guzman)	29 included studies	Pediatric Diabetes	Studies included from January 2000 to June 2019	Studies that described a tele diabetes intervention for pediatric patients with either type 1 or type 2 diabetes.	Pediatric tele diabetes interventions increased the interactions between patients and their providers, increasing specialized care and effective diabetes monitoring.	Systematic Review
53 (Pang)	17 included studies	IBD	Studies included from 2010 to 2020	Studies that described an impact of telemedicine on the standard care on management of IBD.	No consensus for the remote care preferences for patients with IBD due to a high heterogeneity amongst the selected studies.	Systematic Review
54 (Knapp)	303 included studies	Patients utilizing TM from all ranges of medical discipline.	Studies included from 2000-2020	Studies that described patient reported outcome or experience measures in relation to TM interventions.	There is an increasing number of studies that uses patient reported outcomes to assess the efficacy of TM.	Systematic Review

55 (Curtis)	Undefined	Undefined	Medicare data from January 2019-December 2021	Uptake of Remote Physiologic Monitoring (RPM) in the United States	RPM grew approximately 19-fold in 3 years. There is concern of overuse of RPM in patients without clinical benefit.	Cross-Sectional Analysis
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*	Abstracts
TM	Telemedicine
F2F	Face to Face
RA	Rheumatoid Arthritis
PsA	Psoriatic Arthritis
CTD	Connective Tissue Disease
FRAX	Fracture Risk Assessment Tool
IA	Inflammatory Arthritis
SSc	Systemic Sclerosis
VA	Veterans Affairs
SLE	Systemic Lupus Erythematosus
mHAQ	Modified Health Assessment Questionnaire
RMDs	Rheumatic and Musculoskeletal Diseases
KOA	Knee Osteoarthritis
PE	Physical Exam
FU	Follow Up
SLEDAI-2K	Systemic Lupus Erythematosus Disease Activity Index 2000
PGA	Patient Global Assessment
SF-36	Short Form Health Survey
Lupus QoL	Lupus Quality of Life Survey
HADS	Hospital Anxiety and Depression Scale
RCT	Randomized Controlled Trial
OC	Outpatient Conventional Follow-up

TR	Transition Care
PtGA	Patient Global Assessment
RAPID3	Routine Assessment of Patient Index Data 3
DAS28	Disease Activity Score
EQ-5	European Quality of Life-5 Dimensions-5 Level
MGLS	Morisky-Green Levine Medication Adherence Scale
ASAS-R	Appraisal of Self-Care Agency Scale- Revised
SDI	Systemic Lupus International Collaborating Clinics Damage Index
IIM	Idiopathic Inflammatory Myopathy
PRO	Patient Reported Outcomes
ICC	Intraclass Coefficient
AS	Ankylosing Spondylitis
GH	General Health
VAS	Visual Analogue Scale
UCTD	Undifferentiated Connective Tissue Disease
OA	Osteoarthritis
JM	Juvenile Myositis
pGALS	Pediatric Gait Arms Legs Spine Examination
JIA	Juvenile Idiopathic Arthritis
CDAI	Clinical disease activity index
PAS-II	Patient Activity Scale
SDAI	Simplified Disease Activity Index
HAQ-II	Health Assessment Questionnaire II

MDHAQ	Multidimensional Health Assessment Questionnaire
PROMIS	Patient Reported Outcomes Measurement Information Systems
FMS	Fibromyalgia Syndrome
OP	Osteoporosis
AUC	Area Under Curve
PAS-II	Patient Activity Scale
SDAI	Simplified Disease Activity Index
HAQ-II	Health Assessment Questionnaire II
MDHAQ	Multidimensional Health Assessment Questionnaire
PROMIS	Patient Reported Outcomes Measurement Information Systems
ACR	American College of Rheumatology
IBD	Inflammatory Bowel Disease
SF-36	Short Form 36 questionnaire
TSQM	Treatment Satisfaction Questionnaire for Medication
PEPPI	Perceived Efficacy in Patient-Physician Interactions

