

DES OUTILS CONNECTÉS EN RHUMATOLOGIE: POUR QUOI FAIRE?

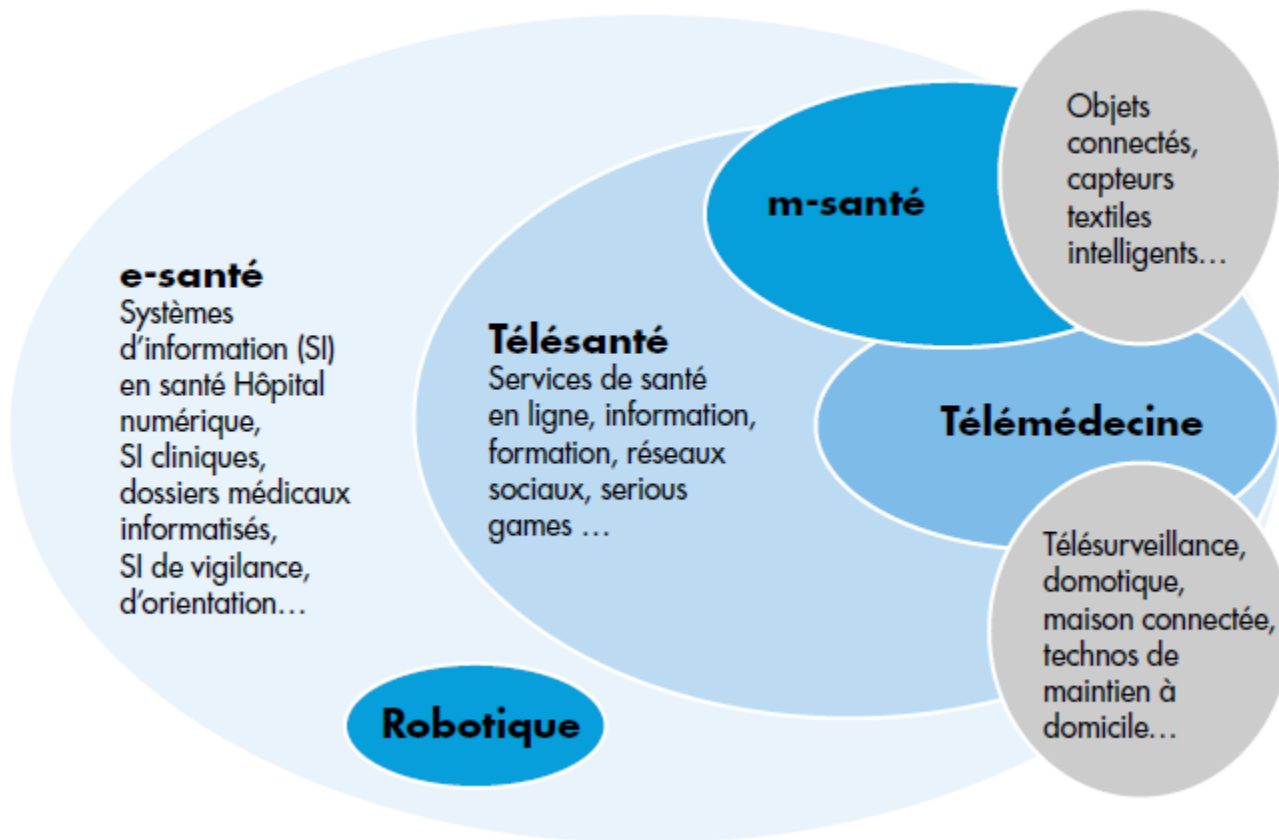
Dewi Guellec (CCA Brest)



GÉNÉRALITÉS

- E-santé:
 - « Application des technologies de l'information et de la communication à l'ensemble des activités en rapport avec la santé »
 - Domaines d'application:
 - Systèmes d'information partagés
 - Télémédecine
 - Services offerts aux patients
 - Formation pour les professionnels
 - ...

GÉNÉRALITÉS



QUELS OUTILS CONNECTÉS EN RHUMATOLOGIE?

- Applications pour Smartphone et/ou tablettes
 - m-Santé
- Plateformes WEB
- Consultations à distance
 - Télémédecine

QUELLES PATHOLOGIES EN RHUMATOLOGIE?

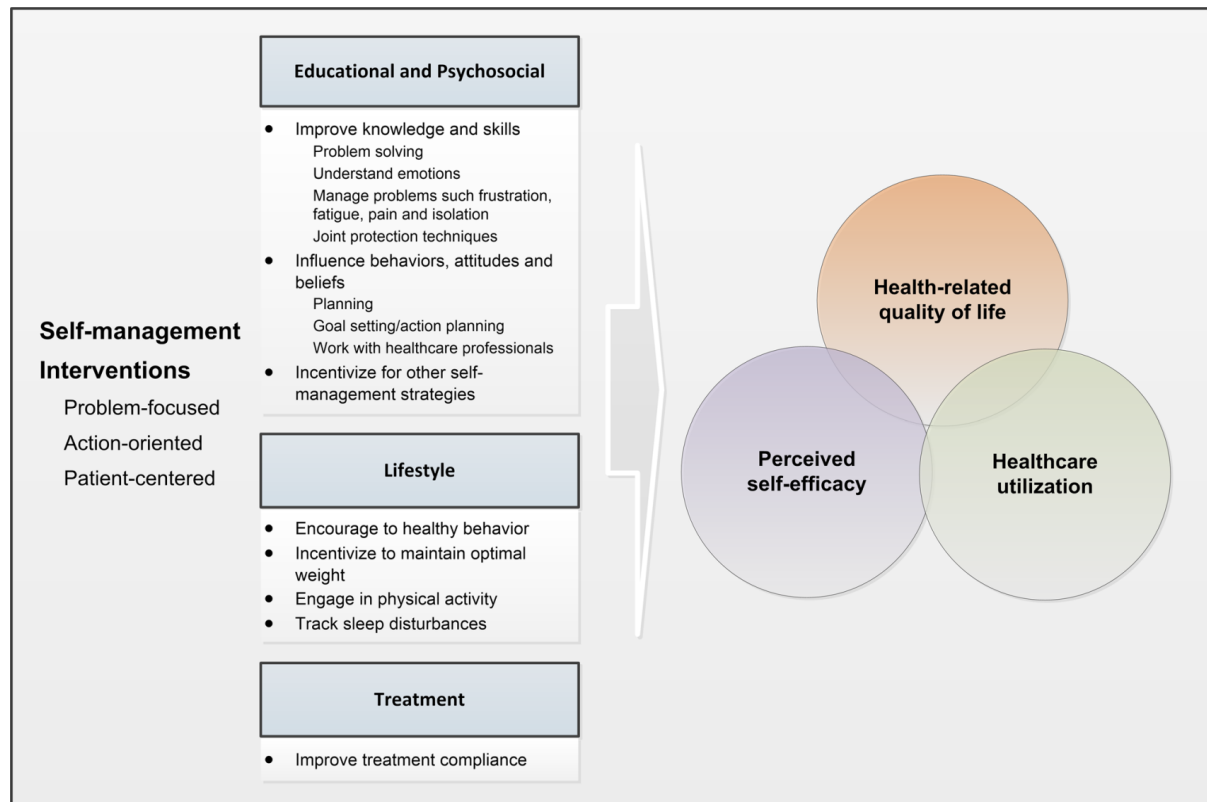
- Affections dysimmunitaires
 - PR
 - SpA
 - Connectivites
- Arthrose
- Ostéoporose
- Goutte
- Pathologies rachidiennes
- ...

QUELS OBJECTIFS?

- Diagnostic de l'affection rhumatismale
- Evaluation de l'activité/sévérité de l'affection
- Education thérapeutique/information du patient
- Evaluation de la tolérance du traitement
- Evaluation de l'observance
- Thérapeutique/modification de comportements
 - Lutte contre l'inactivité physique
 - Lutte contre le tabagisme
 - Exercices supervisés
 - ...
- Formation des médecins et du personnel paramédical

QUELS OBJECTIFS?

- Concept de « self-management »



PROBLÉMATIQUE

- Quelles pathologies rhumatismales doivent être ciblées en priorité?
 - RIC? Arthrose? Goutte? Ostéoporose?
- Quels sont les patients à cibler?
 - Les jeunes?
- Quelle place doit être accordée aux outils connectés en pratique?
- Quelles méthodes doivent être utilisées pour valider les outils connectés?
 - Essais randomisés?
- Quels critères d'évaluation des performances?
 - Indices de satisfaction
 - Qualité de vie
 - Modification de comportements (Activité physique, tabagisme, observance..)
 - Fonction
 - Douleur
 - Scores d'activité (DAS28, BASDAI)

REVUE DE LA LITTÉRATURE



DIAGNOSTIC DE L'AFFECTION RHUMATISMALE

Telerheumatology: A technology appropriate for virtually all

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^c White River Junction Veterans Affairs Medical Center, White River Junction, VT

Table 1
Dartmouth-Hitchcock Medical Center telerheumatology services patient characteristics

Characteristic	Patients	
	N	(%)
Total patients seen	176	
Total patient visits	244	
Mean age in years [SD]	60.3	[16.1]
Gender		
Female	116	(65.9)
Male	60	(34.1)
Patient home state		
New Hampshire	28	(15.9)
Vermont	121	(68.8)
Massachusetts	10	(5.7)
New York	15	(8.5)
Connecticut	2	(1.1)
Primary visit diagnosis		
Rheumatoid arthritis	115	(47.1)
Seronegative spondyloarthropathies	41	(16.8)
Fibromyalgia	21	(8.6)
Osteoarthritis	18	(7.4)
Vasculitis	14	(5.7)
SLE/MCTD/UCTD	12	(4.9)
Osteoporosis	6	(2.5)
Other (sarcoid, systemic sclerosis, dermatomyositis, etc.)	17	(7.0)
Therapies managed via telerheumatology		
DMARDs ¹	86	(35.2)
Injectable biologics ²	38	(15.6)
Infusion biologics ³	11	(4.5)
Steroids (> 5 mg daily)	27	(11.1)
Other (NSAID's, antidepressants, gabapentin)	82	(33.6)

Table 2
Volume data for telerheumatology clinics

Characteristic	Patients		Patient visits	
	N	(%)	N	(%)
Volume seen by provider				
Provider #1	80	(45.4)	136	(55.7)
Provider #2	92	(52.3)	101	(41.4)
Provider #3	4	(2.3)	7	(2.9)
Telemedicine visit location				
Site #1	36	(35.6)	87	(35.7)
Site #2	140	(64.4)	157	(64.3)
Average driving distance in miles from home to				
DHMC	99.0			
Site #1	20.9			
Site #2	24.6			

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Table 3

Characteristics of patients who failed a telerheumatology visit

Patient #	Reason patient failed telereheumatology	Telereheumatology diagnosis	Notes/key insights
1	Disease process/diagnosis is poorly understood	PsA and OA	Worsening pain unclear etiology: PsA flare vs. OA
2		RA	Sero-positive RA failing biologics; needs exam and MSK ultrasound to guide therapy
3		PsA	Methotrexate failure unclear etiology: OA vs. PsA; presenter not helpful in differentiating
4	Diagnosis or disease process is too complex	RA	Pain with unclear etiology: RA flare vs. OA; needed exam before moving onto biologic
5		Sjogrens/gout	Poor patient cooperation/interaction: difficult to perform exam
6		Parkinson's disease	Missed crucial findings (cog wheeling) on video screen; Rheumatology fellow clarified findings
7		Gout	Established gout but question of other positive serologies (ANA and ESR) limited exam
8	Diagnosis or disease process is too complex	Scleroderma	Worsening disease activity and difficult to assess skin and lung exam
9		Dermatomyositis	New leg weakness possible flare; presenter could not perform skin/joint/muscle exam
10		Limited Scleroderma	Worsening shortness of breath; need full skin and lung assessment (presenter not helpful)
11	Diagnosis or disease process is too complex	RA	Lung infection on methotrexate, hypoxia, and very sick patient
12		SLEMCTD	Complex presentation of disease (neutropenia from possible flare or other etiology)
13		RA vs. SLE	Very ill patient not seen for over 3 years, not engaged in care (no chart available)

RA = rheumatoid arthritis; PsA = psoriatic arthritis; SLE = systemic lupus erythematosus; OA = osteoarthritis; MSK = musculoskeletal; MCTD = mixed connective tissue disease.

DIAGNOSTIC DE L'AFFECTION RHUMATISMALE

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Table 4

Calculation of the D-H telerheumatology patient financial and travel savings at the two distinct remote sites based on the Telehealth Network Grant Program (TNGP) formula. Financial savings estimated using current IRS reimbursement for driving (\$0.56 per mile)

Clinical site	Total patient sessions	Total patient travel miles saved	Average miles saved per session	Average dollar amount saved per session	Total dollar amount saved
Site #1	87	17,400	200	\$112	\$9744
Site # 2	157	30,772	196	\$110	\$17,239
Combined total	244	48,172	198	\$111	\$26,938

DIAGNOSTIC DE L'AFFECTION RHUMATISMALE

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Table 5

Proposed triage tool to guide telemedicine in Rheumatology

Condition	Disease state	Candidate for telehealth	Clinical example
Diagnosis/disease well-established	Stable	Yes	Stable well-established disease (RA/PsA/SLE) on DMARD or Biologic therapy needing routine drug monitoring (labs for toxicity etc.)
	Flaring	Maybe	Patient with well-established disease (RA/PsA/SLE) experiencing flare requires escalation of therapy or short course of systemic steroids to control symptoms but no procedure needed
	Needs procedure	No	Requiring arthrocentesis or MSK ultrasound to guide therapy
Diagnosis/disease complex	Complex	No	Complex multi-organ disease (i.e., scleroderma/dermatomyositis/vasculitis) with worsening symptoms where diagnosis/treatment cannot be delayed/missed
Screening prior to in person visit	Any	Yes	PCP calling for initial work-up recommendations or management questions
Failed prior telehealth visit	–	No	If modality will lead to prolonged delay in follow-up of complex disease
Hard of hearing or poor engagement	–	No	Prior bad experience or failure with modality Poor ability to participate in care

RA = rheumatoid arthritis; PsA = psoriatic arthritis; SLE = systemic lupus erythematosus; MSK = musculoskeletal; PCP = primary care provider.

DIAGNOSTIC DE L'AFFECTION RHUMATISMALE

Satisfaction with rural rheumatology telemedicine service

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Table 3 Comparisons of participants' satisfaction statement responses between face-to-face and telemedicine consultation groups

Statement	Strongly agreeing with statement			P-value†
	Mount Isa Telemedicine (n = 49) (%)	Mount Isa Face-to-face (n = 12) (%)	Townsville Face-to face (n = 46) (%)	
I could talk to the specialist easily and openly	34 (70.8)	10 (83.3)	25 (55.6)	0.213
I felt I could ask my specialist questions	36 (73.5)	10 (90.9)	26 (59.1)	0.125
I did not feel that anything important was missed during my visit with my doctor	30 (61.2)	10 (90.9)	27 (61.4)	0.086
I understood what the specialist told me	33 (68.8)	8 (72.7)	27 (61.4)	0.689
I felt that the doctor and the nurse answered all of my questions and concerns	34 (69.4)	9 (81.8)	27 (61.4)	0.608
I felt the specialist was able to understand my situation and provide satisfactory care	32 (66.7)	9 (81.8)	22 (50.0)	0.273
I felt my privacy and confidentiality were preserved during my visit with my doctor	32 (68.1)	10 (90.9)	26 (60.5)	0.123
I feel it is important for the specialist to physically examine me	20 (44.4)	7 (63.6)	21 (50.0)	0.548
I was able to develop a friendly relationship with my specialist	24 (52.2)	10 (90.9)	19 (43.2)	0.018
I feel confident I can take my medications safely after this appointment	34 (70.8)	10 (90.9)	25 (58.1)	0.154
I feel comfortable discussing the sensitive things about my illness with my specialist	30 (65.2)	10 (90.9)	29 (65.9)	0.136

†P-values are results of Fisher's exact tests comparing responses of participants as given in Table 2 between the three groups. Not all participants answered all questions.

Conclusions: These results suggest that patients are satisfied with a rheumatology telemedicine service, and may prefer this to extensive travelling. Evaluation in other settings is recommended before generalizing this finding.

DIAGNOSTIC DE L'AFFECTION RHUMATISMALE

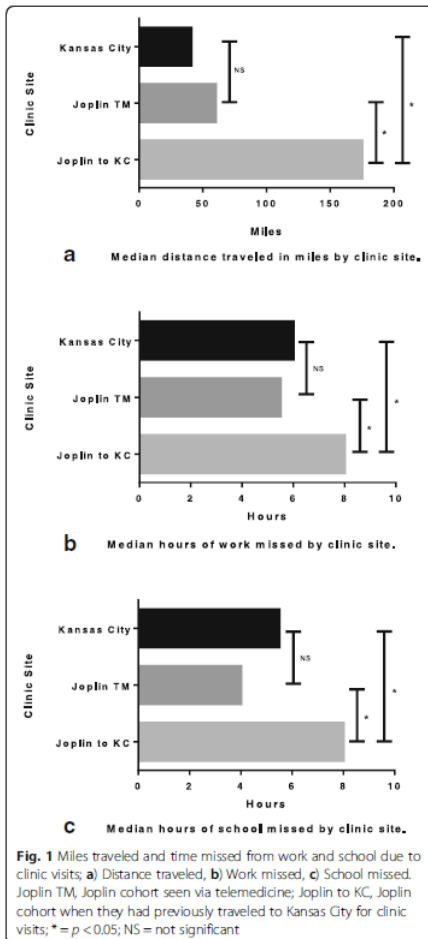


Table 1 Patient reported costs associated with Kansas City clinic visits and interest in telemedicine

	No interest	Interest	p-value
Work hours missed (median [IQR]) $n = 84$	4.0 [3.0–8.0]	8.0 [6.0–8.0]	<0.001
School hours missed (median [IQR]) $n = 109$	4.0 [2.0–8.0]	7.5 [3.5–8.0]	0.100
Amount of money spent (median [IQR]) $n = 73$	\$20.00 [15–50]	\$27.50 [20–50]	0.437
Miles traveled (median [IQR]) $n = 184$	25 [15–61.5]	67.5 [32.5–154]	<0.001



EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Polyarthrite rhumatoïde
- Pathologies rachidiennes
- Pathologies de l'épaule
- Arthrose

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Polyarthrite rhumatoïde
 - 94% des patients pensent qu'ils pourraient avoir un rôle plus actif dans la prise en charge de leur affection au quotidien.
 - 86% des patients rapportent qu'un outil d'autogestion/auto-évaluation de la PR leur serait probablement utile.
 - 82% des patients seraient prêts à payer pour une telle application.
 - Les patients prêts à utiliser un tel outil sont plus jeunes.



EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

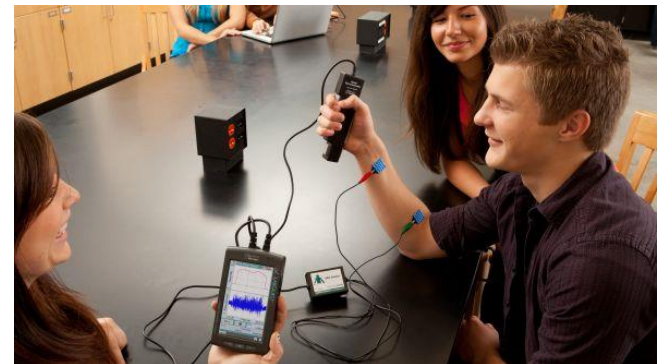
- Polyarthrite rhumatoïde
 - Auto-évaluation de l'activité de la maladie
 - Méthodes usuelles
 - Méthodes alternatives

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Polyarthrite rhumatoïde
 - Auto-évaluation de l'activité de la maladie
 - Méthodes alternatives
 - Systèmes d'auto-évaluation de l'activité de la PR via une application pour Smartphone
 - Auto-évaluation du NAD
 - Auto-évaluation du NAG
 - mHAQ
 - Mesure des paramètres d'accélération du tronc
 - Une combinaison de ces paramètres est capable de prédire l'activité de la PR

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Polyarthrite rhumatoïde
 - Auto-évaluation de l'activité de la maladie
 - Méthodes alternatives
 - Mesure de la force de préhension par un dynamomètre
 - 82 patients
 - 76,8 % de femmes
 - 61,3 ans

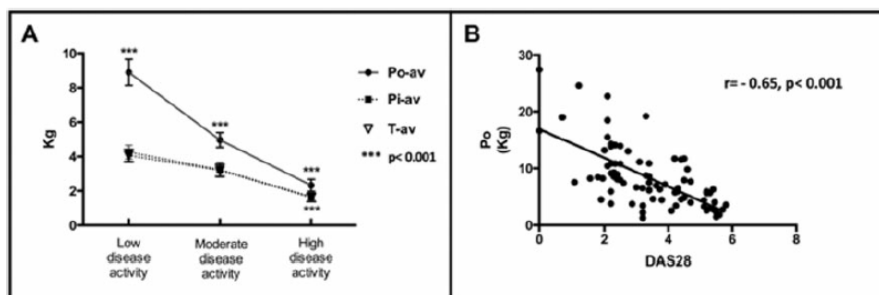


<http://www.vernier.com/products/sensors/hd-bta/>

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Polyarthrite rhumatoïde
 - Auto-évaluation de l'activité de la maladie
 - Méthodes alternatives

Fig. 1 Grip strength and RA disease activity



(A) Po, Pi and T grip according to the level of disease activity (low, moderate or high). (B) Linear regressions between power, pinch and tripod grip strength and DAS28 score. *** $P < 0.001$. Po: power grip strength; Pi: pinch grip strength; T: tripod grip strength.

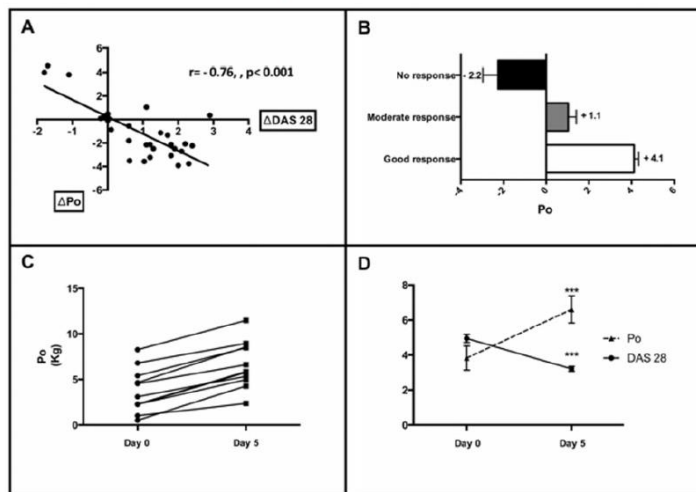
Rheumatology key messages

- Assessment of handgrip strength in RA is strongly correlated with DAS28 score.
- Handgrip strength is independently correlated with two other markers of RA disease activity; patient global assessment and CRP level.
- Handgrip strength assessed by a personal device represents a self-assessment instrument of RA disease activity.

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Polyarthrite rhumatoïde
 - Auto-évaluation de l'activité de la maladie
 - Méthodes alternatives

Fig. 2 Prospective evaluation of handgrip strength



In a subgroup of patients (n=32) at 3 months, (A) Correlation between change between second measure vs baseline (Δ) DAS28 and Δ Po grip. (B) Changes of Po grip according to DAS-EULAR response criteria. Changes in Po grip (C) and in DAS28 (D) after an RA flare treated by i.v. CS. *** $P < 0.001$. Po: power grip strength; Pi: pinch grip strength; T: tripod grip strength.

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Pathologie rachidienne

The usefulness of a mobile device-based system for patient-reported
outcomes in a spine outpatient clinic

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Received 5 September 2015; revised 28 January 2016; accepted 23 February 2016

- 103 patients
- Consultation de pathologies rachidiennes
- « PRO »

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Pathologie rachidienne



Fig. 1. Mobile device. The mobile system is composed of a tablet personal computer and barcode scanner (arrow). The instructions are displayed on the screen of the tablet personal computer (PC). The patients scan barcode at their hospital identification card or receipt on the barcode scanner and the program automatically starts.

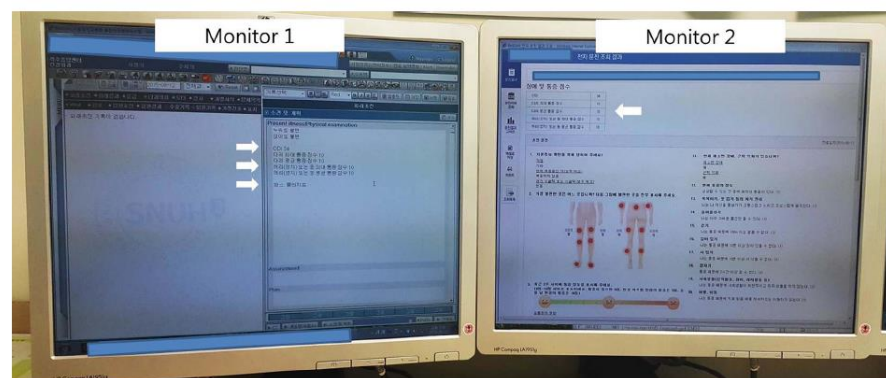


Fig. 2. The use of patient-reported outcome (PRO) in outpatient clinic. The result of PRO is displayed in monitor 2. Monitor 1 shows electrical medical recording (EMR) system. The summed results of PRO is shown in monitor 2 (white arrow), and those are copied and pasted in electronic medical recording system in monitor 1 (white arrows).

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Pathologie rachidienne

Table 3

Responses about the efficacy of the mobile system

		n (%)					p-Value*	PRS score [†] Mean (95% CI)
		Very negative	Negative	Neutral	Positive	Very positive		
At the waiting room	Waiting time	4 (4.2)	12 (12.5)	23 (24.0)	35 (36.5)	22 (22.9)	<.001	78.9 (75.6, 82.2)
	Represent condition	0 (0.0)	11 (11.5)	—	32 (33.3)	53 (55.2)	<.001	
	Time to answer	2 (2.1)	10 (10.4)	18 (18.8)	32 (33.3)	34 (35.4)	<.001	
During clinic	Doctor's understanding	2 (2.1)	8 (8.3)	—	33 (34.4)	53 (55.2)	<.001	80.5 (77.1, 83.9)
	Sufficient counseling	3 (3.1)	14 (14.6)	—	39 (40.6)	40 (41.7)	<.001	
	Time to understand	1 (1.0)	28 (29.2)	—	35 (36.5)	32 (33.3)	<.001	
Overall satisfaction		3 (3.1)	5 (5.2)	—	53 (55.2)	35 (36.5)	<.001	83.3 (79.6, 87.0)
Widespread use of system		4 (4.2)	21 (21.9)	—	31 (32.3)	40 (41.7)	<.001	77.1 (71.9, 82.3)
Total mean positive response score (PRS)		—	—	—	—	—	—	79.8 (76.7, 82.9)

* Chi-squared test.

[†] Each question was measured on a 5-point scale (ranging from very negative response [1] to very positive response [5]), and scores were summed and converted to a range from 0 to 100; higher scores indicate a positive response.

CI, confidence interval; PRS, positive response score.

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Pathologie rachidienne

Table 4
Predictors of positive response score (PRS)

Predictors		Scores (per 100) mean (SD)	p-Value*	Multivariable analysis [‡]		
				β Coefficient (95% CI)	p-Value	p-Value
Intercept		—	—	66.6 (59.7, 73.4)	<.001	
Gender	Male (reference, ref)	79.0 (15.4)	.444	12.7 (4.8, 20.6)	.002	.002
	Female	81.1 (15.5)				
Age	>60 (ref)	71.7 (17.6)	.001			
	<20	88.3 (9.7)				
	21–30	90.0 (.)				
	31–40	90.5 (11.7)				
	41–50	77.5 (12.6)				
	51–60	83.7 (9.9)				
Use of smartphones	No (ref)	67.6 (16.8)	<.001			
	Yes	84.9 (11.5)				
Familiarity with smartphone applications	Non-smartphone user (ref)	67.6 (16.8)	<.001			
	≥10 Applications from mobile market	89.8 (11.2)				
	3–9 Applications from mobile market	77.2 (14.1)				
	1–2 Applications from mobile market	84.2 (11.1)				
	Use only basic applications on the smartphone	83.5 (8.3)				
	Use only phone and text message functions	—				
Site of pain	Cervical (ref)	79.9 (15.2)	.744			
	Thoracic	81.9 (20.7)				
	Lumbar	80.4 (15.5)				
	Not answered	72.5 (7.6)				
Proficiency of typing	Not skillful (ref)	74.5 (13.8)	<.001	0.9 (–8.3, 10.2)	.847	.046
	Poor	68.3 (16.1)				
	Skillful	83.4 (13.7)				
	Very skillful	91.3 (9.8)				
Level of education	≥University or college (ref)	73.3 (14.8)	.001	11.9 (3.7, 20.2)	.005	
	≤High school	84.2 (13.6)				
	Not answered	67.5 (26.0)				

* p-Value from ANOVA; "Not answered" was not included in ANOVA.

† R-square=0.325.

‡ p-Value from type III test.

SD, standard deviation; CI, confidence interval.

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Arthrose
 - WOMAC pour applications mobiles
 - m-WOMAC
 - Evaluation initiale sur un petit nombre de sujets âgés
 - $n = 12$
 - Indice de satisfaction élevé
 - Evaluation secondaire de la corrélation avec la version papier
 - Bonne corrélation ($r=0,90$)

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Arthrose

Table 3

Estimated marginal mean scores (with standard errors) and differences between m-WOMAC and p-WOMAC scores pre- and postsurgery

Presurgery				Postsurgery			
m-WOMAC	p-WOMAC	Difference	% Diff ^a	m-WOMAC	p-WOMAC	Difference	% Diff ^a
WOMAC pain scores							
27.12 (1.24)	26.74 (1.24)	0.37 (1.20)	1	9.90 (1.33)	9.43 (1.33)	0.47 (1.32)	5
WOMAC stiffness scores							
11.40 (0.57)	11.26 (0.57)	0.14 (0.616)	1	5.23 (0.62)	5.55 (0.62)	-0.32 (0.68)	-6
WOMAC function scores							
103.6 (4.59)	100.03 (4.59)	3.54 (4.08)	2	44.1 (4.90)	42.6 (4.90)	1.58 (4.48)	2
WOMAC TIS							
142.1 (6.18)	138.0 (6.18)	4.06 (5.63)	3	59.3 (6.60)	57.6 (6.60)	1.73 (6.18)	3

Abbreviations: TIS, total index score; WOMAC, Western Ontario and McMaster.

Marginal means are estimated over the levels of occasion within pre- and postsurgery, sequence of mode delivery and the joint replaced.

^a Difference as a percentage of average estimated score.

Table 5

Preference for mode of delivery for three different phone features

Feature	No difference, <i>n</i> (%)	m-WOMAC preferred, <i>n</i> (%)	p-WOMAC preferred, <i>n</i> (%)	Comparison of mode preference
Ease of instructions	33 (64)	7 (13)	12 (23)	$\chi^2 = 1.32, P = 0.36$
Ease of completion	31 (60)	11 (21)	10 (19)	$\chi^2 = 0.05, P > 0.99$
Overall	28 (54)	14 (27)	10 (19)	$\chi^2 = 0.67, P = 0.54$

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Pathologies de l'épaule

Measurement Properties of the Smartphone-Based B-B Score in Current Shoulder Pathologies

Claude Pichonnaz ^{1,2,*}, Cyntia Duc ³, Nigel Gleeson ⁴, Céline Ancey ¹, Hervé Jaccard ^{1,2}, Estelle Lécureux ⁵, Alain Farron ², Brigitte M. Jolles ² and Kamiar Aminian ³

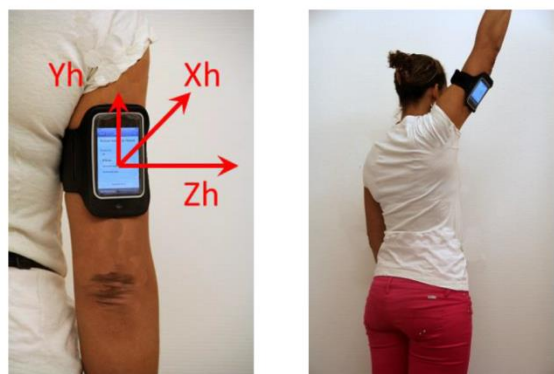
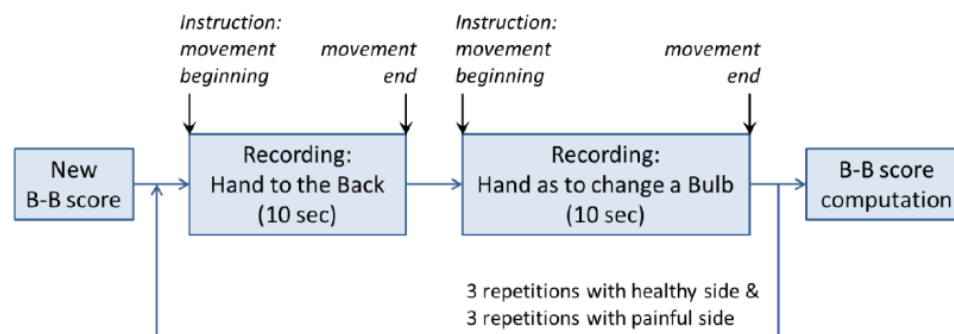


Figure 1. iPod® attached to the arm during the test completion.



EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Pathologies de l'épaule

Table 2. Mean and standard deviation of the B-B Score. Unit of scores are % representing the performance of the pathological side compared to the healthy side.

Pathology	Control	Rotator Cuff	Humerus Fracture	Capsulitis	Shoulder Instability
Baseline					
Mean (SD)	94.1 (11.1) *	63.1 (19.7) *	46.3 (17.5) *	54.4 (14.6) *	84.5 (22.6)
Sample size	20	20	23	22	23
6 months					
Mean (SD)	96.0 (8.3) *	77.6 (21.1) *.†	78.9 (15.1) *.†	75.3 (20.5) *.†	91.2 (15.6)
Sample size	20	19	20	21	20

* Significant difference with the control group ($p < 0.01$); † Significant difference with baseline ($p < 0.01$).

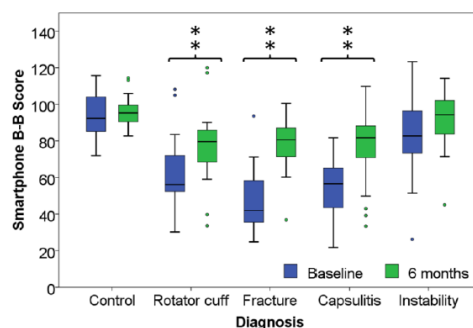


Figure 3. Outcome of the B-B Score for the control group and the pathology groups.

***: significant difference with the control group $p < 0.01$.

EVALUATION DE LA SÉVÉRITÉ/ACTIVITÉ DE L'AFFECTION RHUMATISMALE

- Pathologies de l'épaule

Table 5. Spearman correlation coefficients between B-B Score and clinical questionnaires.

	Rotator Cuff	Humerus Fracture	Capsulitis	Shoulder Instability
Constant	0.82 **	0.70 **	0.68 **	0.46 *
Relative Constant	0.84 **	0.69 **	0.69 **	0.43 *
SST	0.63 **	0.66 **	0.76 **	0.52 *
QuickDASH	-0.55 *	-0.40	-0.64 **	-0.57 **
WOSI	-	-	-	0.58
VAS pain	-0.50 *	-0.07	-0.39	-0.19
EQ5D	0.33	0.18	0.63 **	0.46 *
EQ5D-VAS	0.16	-0.30	0.44 *	0.47 *

SST: simple shoulder test; QuickDASH: Quick Disabilities of the Arm, Shoulder and Hand score; WOSI: Western Ontario Shoulder Instability Index; SSV: Subjective Shoulder Value; VAS: Visual Analog Scale.

* significant correlation ($p < 0.05$); ** significant correlation ($p < 0.01$).

EDUCATION THÉRAPEUTIQUE/INFORMATION DU PATIENT

Proof-of-Concept Study of a Web-Based Methotrexate Decision Aid for Patients With Rheumatoid Arthritis

LINDA C. LI,¹ PAUL M. ADAM,² CATHERINE L. BACKMAN,¹ SYDNEY LINEKER,³ C. ALLYSON JONES,⁴
DIANE LACAILLE,¹ ANNE F. TOWNSEND,¹ ELAINE YACYSHYN,⁴ CHARLENE YOUSEFI,⁵
PETER TUGWELL,⁶ JENNY LEESE,⁵ AND DAWN STACEY⁷

Report for Doctor
Rheumatoid Arthritis and Methotrexate Decision Aid

This report is produced by the ANSWER (Animated Self-serve Web-based Research program). It summarizes your patient's health, and thoughts about taking methotrexate for rheumatoid arthritis. The report is intended to help your discussion with your patient. The ANSWER was developed through funding from the Canadian Institutes of Health Research. For more information, contact ANSWER@arthritisresearch.ca OR (800) 871-4372, toll-free 1(877) 871-4375.

Name: _____ Date completed: _____

My Health Assessment Questionnaire Score: 2 / 3
(0-3, high score = more severe disease)

My arthritis activity (0 = best, 10 = worst)

- In the past six months, I would rate the activity of my arthritis: 4 / 10
- Today, I rate my joint tenderness and swelling: 6 / 10
- Today, I rate my arthritis pain: 5 / 10
- Today, my joints were stiff when I woke up.
- This joint stiffness lasted 1 to 2 hours.

Location of joint pain:

RIGHT LEFT

How important is it to me...

	Not Important		Very Important
To improve joint pain because of rheumatoid arthritis?	☐	☒	☐
To avoid joint damage because of rheumatoid arthritis?	☐	☒	☐
To avoid limitation in my physical function because of rheumatoid arthritis?	☐	☒	☐
To avoid all side effects after taking methotrexate?	☐	☒	☐
To become pregnant (me or my partner) over the next 12 months?	☐	☒	☐
To have more than 2 alcoholic drinks a week?	☐	☒	☐

Other things that are important to me are...

1. _____

2. _____

3. _____

Thinking about what is most important to me, I prefer to...

☐ Take Methotrexate ☐ Decline Methotrexate, discuss with my doctor about other treatment options ☒ I don't know

What I would like my doctor to know...

	Yes	No	Not Sure
At this point, I know enough about the benefits and side effects to make a decision about methotrexate.	☒	☐	☐
I am clear about which benefits and side effects matter the most to me.	☐	☒	☐
I have enough support and advice to make a choice.	☒	☐	☐
I feel sure about the best choice for me.	☒	☐	☐

Before making the final decision I need to:

Figure 1. Animated, Self-serve, Web-based Research tool (ANSWER) summary for patient.

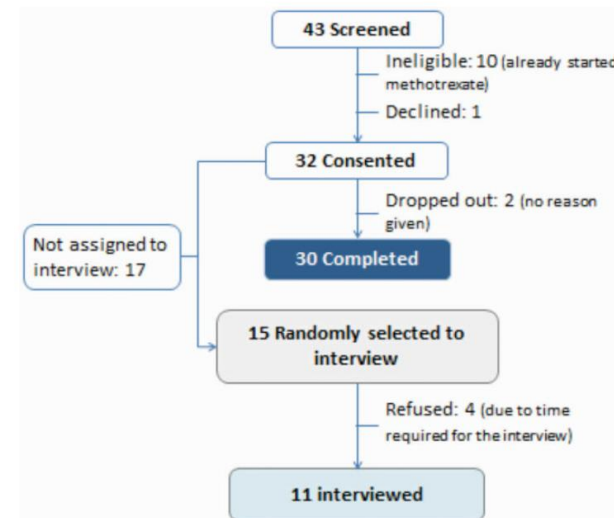


Figure 2. Study design.

EDUCATION THÉRAPEUTIQUE/INFORMATION DU PATIENT

Table 2. Pre-post study results (n = 30)*				
	Before	After	Difference (95% CI)	P
DCS (range 0–100, lower = less conflicted)	49.50 ± 23.17	21.83 ± 24.12	–27.67 (–39.89, –15.44)	< 0.001
Uncertainty subscale	78.33 ± 31.98	37.50 ± 43.43	–40.83 (–60.54, –21.12)	< 0.001
Informed subscale	38.33 ± 34.51	18.89 ± 35.49	–19.44 (–37.53, –1.36)	0.036
Values clarity subscale	42.50 ± 34.83	11.67 ± 22.49	–30.83 (–45.99, –15.68)	< 0.001
Support subscale	44.44 ± 30.43	21.11 ± 25.12	–23.33 (–37.75, –8.91)	0.002
Methotrexate in RA Knowledge Test (range 0–60, higher = better)	30.62 ± 9.62	41.67 ± 6.81	11.03 (6.73, 15.34)	< 0.001
EC-17 (range 0–100, higher = better)	68.24 ± 12.46	72.94 ± 12.74	4.71 (–1.81, 11.22)	0.15
DCS score, no. (%)			–	
<25	3 (10.0)	20 (66.7)		< 0.001
25–37.5	6 (20.0)	3 (10.0)		
>37.5	21 (70.0)	7 (23.3)		

* Values are the mean ± SD unless indicated otherwise. 95% CI = 95% confidence interval; DCS = Decisional Conflict Scale; RA = rheumatoid arthritis; EC-17 = Effective Consumer Scale.

DCS: Echelle du conflit décisionnel

EDUCATION THÉRAPEUTIQUE/INFORMATION DU PATIENT

RESEARCH ARTICLE

Open Access



The iPeer2Peer Program: a pilot randomized controlled trial in adolescents with Juvenile Idiopathic Arthritis

Jennifer Stinson^{1,2*}, Sara Ahola Kohut³, Paula Forgeron⁴, Khush Amaria³, Mary Bell⁵, Miriam Kaufman⁶, Nadia Luca⁷, Stephanie Luca², Lauren Harris², Charles Victor⁸ and Lynn Soideel⁹

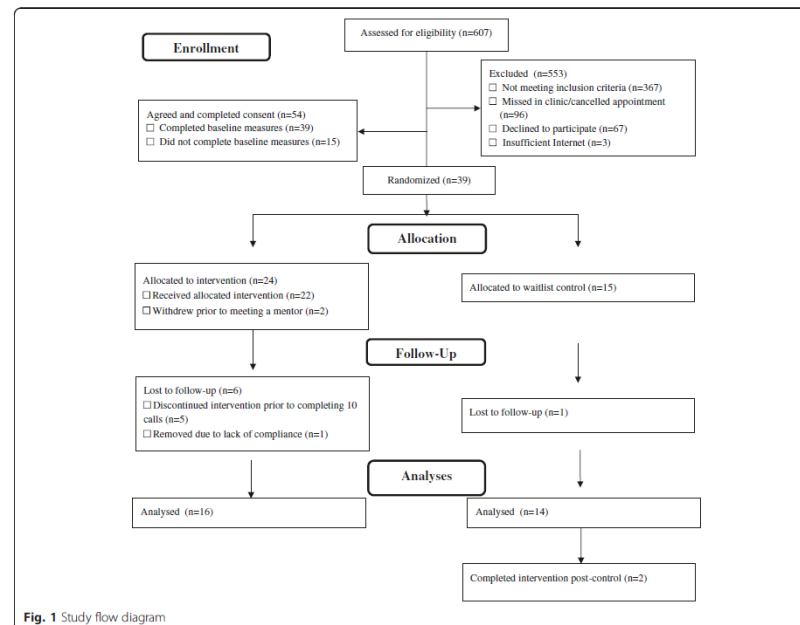


Fig. 1 Study flow diagram



EDUCATION THÉRAPEUTIQUE/INFORMATION DU PATIENT

- Niveau d'engagement élevé dans le programme
- Amélioration subjective de la capacité à prendre en charge son affection ($p = 0,04$)

EVALUATION DE L'OBSERVANCE

- Pas de publication dans le domaine de la rhumatologie
- Applications en cardiologie (exemple)

Effects of interactive patient smartphone support app on drug adherence and lifestyle changes in myocardial infarction patients: A randomized study



Nina Johnston, MD, PhD,^a Johan Bodegard, MD, PhD,^b Susanna Jerström, MSc,^b Johanna Åkesson, MSc,^b Hilja Brorsson,^c Joakim Alfredsson, MD, PhD,^d Per A. Albertsson, MD, PhD,^c Jan-Erik Karlsson, MD, PhD,^f and Christoph Varenhorst, MD, PhD^a *Uppsala, Södertälje, Linköping, and Gothenburg, Sweden*

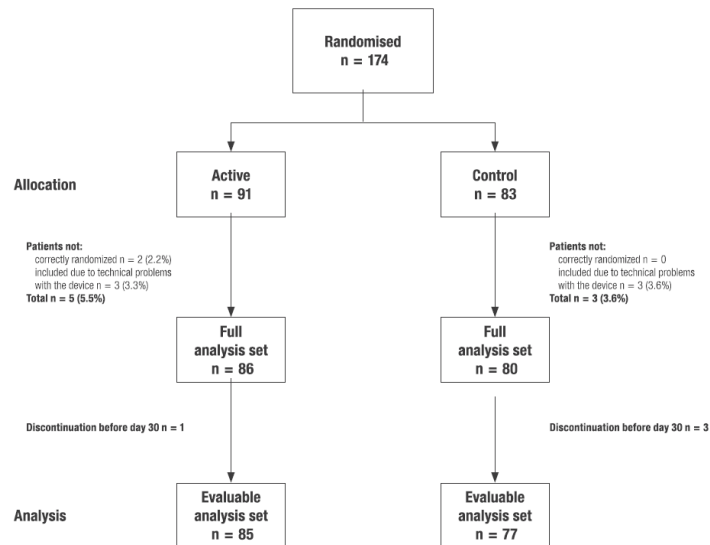
Figure 1



The complete interactive patient support tool (app), covering the start page, e-diary, exercise module, BMI module, and blood pressure module (from left to right).

EVALUATION DE L'OBSERVANCE

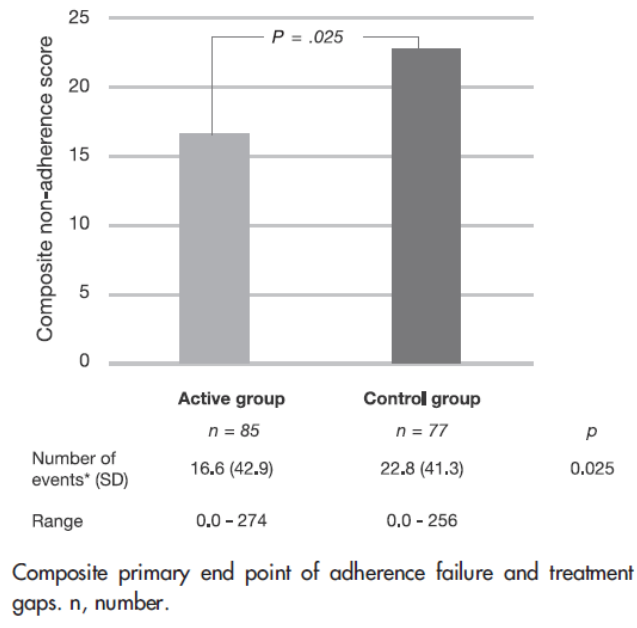
- Pas de publication dans le domaine de la rhumatologie
- Applications en cardiologie (exemple)



Patient flowchart.

EVALUATION DE L'OBSERVANCE

- Pas de publication dans le domaine de la rhumatologie
- Applications en cardiologie (exemple)



EVALUATION DE L'OBSERVANCE

- Pas de publication dans le domaine de la rhumatologie
- Applications en cardiologie (exemple)

	Active group	Control group	Total	P
Clinical outcome				
Smoking, n (%)	22 (25.6)	12 (15.0)	34 (20.5)	.135
Quitters, n (%)	16 (-80.0)	5 (-45.5)	21 (-67.7)	.139
n	81	72	153	
BMI, kg/m ² , mean, (SD)	28.9 (5.6)	28.4 (4.7)	28.7 (5.2)	.698
BMI change (kg/m ²), mean (%)	-0.6 (-2)	-0.5 (-2)	-0.6 (-2)	.366
n	80	72	152	
LDL cholesterol (mmol/L), mean (SD)	3.9 (1.2)	3.3 (0.9)	3.6 (1.1)	.011
LDL cholesterol change (mmol/L), mean (%)	-1.8 (-44)	-1.0 (-26)	-1.5 (-36)	.004
n	34	30	64	
SBP (mm Hg), mean (SD)	131.1 (14.6)	125.2 (17.9)	128.2 (16.5)	.015
SBP change (mm Hg), mean (SD) (%)	-0.6 (-0.3)	-1.1 (-0.4)	-0.9 (-0.3)	.749
n	80	72	152	
Exercise				
No. of physical activity sessions per week (SD)	3.5 (2.6)	3.5 (2.6)	3.5 (2.6)	.867
Change (median), sessions per week (%)	+1.5	+1.0	+1.0	.770
n	80	71	151	
Exercise minutes per week (SD)	181.2 (209.8)	201.1 (198.8)	190.8 (204.2)	.527
Change (median), minutes per week (%)		+65.0	+75.0	.612
n	80	71	151	
Exercise >150 min/wk	46.5%	51.3%	48.8%	.649
Change, exercise > 150 min/wk (%)	+33.8%	+21.1%	+27.8%	
n	80	71	151	
QoL (EQ-5D VAS)				
Baseline	67.8 (19.3)	69.1 (19.5)	68.4 (19.3)	.622
End of study	82.7 (11.6)	78.2 (15.3)	80.6 (13.6)	.090
Change, VAS score (%)	+14.7 (+38)	+8.4 (+21)	+11.7 (+30.0)	.059
n	80	71	151	

Abbreviations: LDL, Low-density lipoprotein; n, number; SBP, systolic blood pressure.

EVALUATION DE L'OBSERVANCE

- Pas de publication dans le domaine de la rhumatologie
- Applications en cardiologie (exemple)
- Perspectives +++
 - PR
 - SpA et AINS
 - Ostéoporose
 - Goutte

EVALUATION DE LA TOLÉRANCE

- Pas de publications dans le domaine de la rhumatologie
- Publications en oncologie
- Perspective d'applications adaptées aux DMARDs et aux biomédicaments

A pilot study: dose adaptation of capecitabine using mobile phone toxicity monitoring — supporting patients in their homes

Andrew Weaver • Sharon B. Love • Mark Larsen • Milensu Shanyinde •
Rachel Waters • Lisa Grainger • Vanessa Shearwood • Claire Brooks •
Oliver Gibson • Annie M. Young • Lionel Tarassenko

Fig. 1 Flowchart in monitoring patient's condition and sending mobile advice regarding self-care, medication and dosage

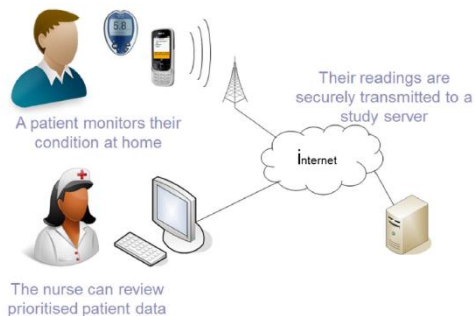
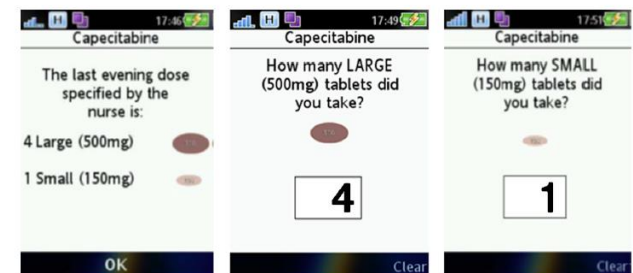


Fig. 2 Screen shots of medication advice as to capecitabine dosage followed by a prompt for the patients to confirm how many tablets had been taken



THÉRAPEUTIQUE/MODIFICATION DU MODE DE VIE

- Pas d'applications ayant dépassé le stade d'études de faisabilité/études pilotes dans le domaine de la rhumatologie



ORIGINAL ARTICLE

Mobile internet service for self-management of physical activity in people with rheumatoid arthritis: evaluation of a test version

Åsa Revenäs,¹ Christina H Opava,^{1,2} Henrik Ahlén,³ Maria Brusewitz,⁴ Susanne Pettersson,^{1,2} Pernilla Åsenlöf⁵

Key messages

What is already known about this subject?

- ▶ Life-long adherence to health-enhancing physical activity (PA) is a major challenge for most people with rheumatoid arthritis (RA).
- ▶ To date, there is no evidence-based mobile internet service available focusing on self-management of PA adapted to the specific needs of people with RA.

What does this study add?

- ▶ People with RA reported the co-designed RA-specific mobile internet service, tRAppen, to be feasible and to provide support for PA in a subpopulation at certain risk of poor health.
- ▶ Variations in disease activity, PA level and personal preferences were perceived as affecting the utilisation of, and experiences with, the service and, hence, highlights the importance of customising tRAppen according to individual preferences.

How might this impact on clinical practice?

- ▶ tRAppen could complement supervised exercise provided in rheumatology care and make an evidence-based healthcare service available to more patients for use in everyday life, thus contributing to their long-term health.

FORMATION DES MÉDECINS ET DU PERSONNEL PARAMÉDICAL

Online Training on Skin Cancer Diagnosis in Rheumatologists: Results from a Nationwide Randomized Web-Based Survey

Manuelle Viguier^{1*}, Stéphanie Rist², François Aubin³, Marie-Thérèse Leccia⁴, Marie-Aleth Richard⁵, Marina Esposito-Farèse⁶, Philippe Gaudin⁷, Thao Pham⁸, Pascal Richette⁹, Daniel Wendling¹⁰, Jean Sibilia¹¹, Florence Tubach⁶, Club Rhumatismes et Inflammation[¶]

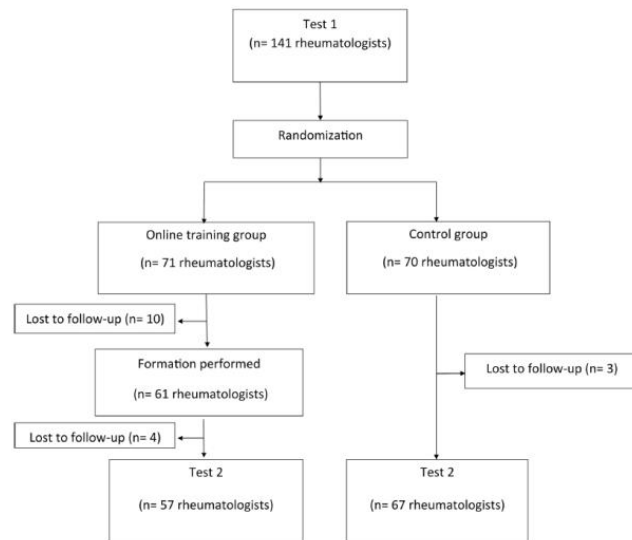


Fig 1. Study flow chart.

doi:10.1371/journal.pone.0127564.g001

FORMATION DES MÉDECINS ET DU PERSONNEL PARAMÉDICAL

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Manuelle Viguier^{1*}, Stéphanie Rist², François Aubin³, Marie-Thérèse Leccia⁴, Marie-Aleth Richard⁵, Marina Esposito-Farèse⁶, Philippe Gaudin⁷, Thao Pham⁸, Pascal Richette⁹, Daniel Wendling¹⁰, Jean Sibilia¹¹, Florence Tubach⁶, Club Rhumatismes et Inflammation¹¹

Table 5. Impact of online training (Test 2).

Scores (range)	Online training group (n = 71)	Control group (n = 70)		
	Mean score	Mean score	[CI 95%]	p
1 : Benign vs premalignant/malignant (0–20)	13.4	11.2	[1.3; 3.1]	7.6x10 ⁻⁶
2 : Level of confidence (0–10)	5.6	5.7	[-0.7 ; 0.3]	0.46
3 : Precise diagnosis (0–20)	11.7	9.6	[1.1 ; 3.1]	9.3x10 ⁻⁵
4 : MCQ (0–25)	21.7	20.8	[0.2; 1.7]	0.016

MCQ: multiple choice questionnaires

doi:10.1371/journal.pone.0127564.t005

FORMATION DES MÉDECINS ET DU PERSONNEL PARAMÉDICAL

Policy-Into-Practice for Rheumatoid Arthritis: Randomized Controlled Trial and Cohort Study of E-Learning Targeting Improved Physiotherapy Management

ROBYN E. FARY,¹ HELEN SLATER,¹ JASON CHUA,² SONIA RANELLI,¹ MADELYNN CHAN,³ AND ANDREW M. BRIGGS⁴

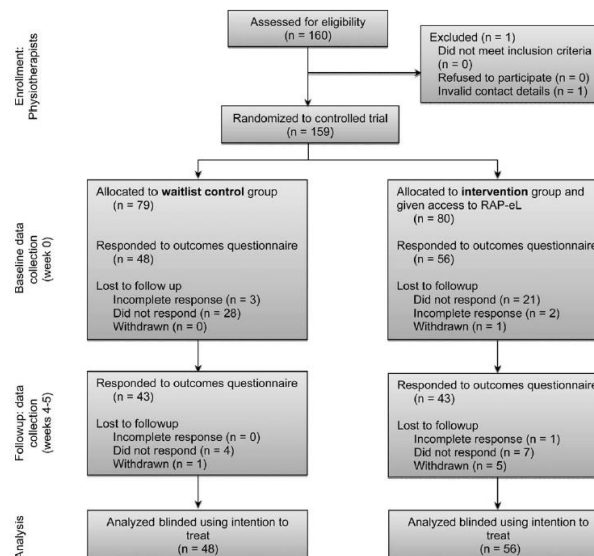


Figure 1. CONSORT flow chart of participants through randomized controlled trial. RAP-eL = Rheumatoid Arthritis for Physiotherapists e-Learning.

FORMATION DES MÉDECINS ET DU PERSONNEL PARAMÉDICAL

Table 3. Between-group confidence, satisfaction, and vignette response differences in the RCT, adjusted for baseline scores*							
	Baseline		4 weeks		Between-group adjusted mean difference (95% CI)	P	Effect size
	Control (n = 48)	Intervention (n = 56)	Control (n = 48)	Intervention (n = 56)			
Confidence in knowledge (summation of 5-point Likert scale, of possible 45)	20.67 ± 4.73	22.98 ± 5.75	21.38 ± 5.14	31.48 ± 7.70	8.51 (6.29, 10.73)	< 0.001	1.62
Confidence in skills (summation of 5-point Likert scale, of possible 40)	17.15 ± 3.91	18.75 ± 5.53	18.79 ± 5.14	27.27 ± 7.57	7.26 (5.1, 9.43)	< 0.001	1.54
Satisfaction (10-point Likert scale)	3.42 ± 1.72	3.77 ± 1.78	3.79 ± 1.98	6.11 ± 2.14	2.06 (1.42, 2.70)	< 0.001	1.18
Prediagnosis vignette (modified ACREU Primary Care Survey, of possible 6)	3.44 ± 1.13	3.16 ± 1.26	3.23 ± 1.21	3.86 ± 1.09	0.76 (0.37, 1.15)	< 0.001	0.50
Early stage RA vignette (modified ACREU Primary Care Survey, of possible 9)	3.38 ± 1.62	3.21 ± 1.61	3.10 ± 1.65	5.45 ± 1.67	1.49 (0.88, 2.10)	< 0.001	0.92
* Values are the mean ± SD unless otherwise indicated. RCT = randomized controlled trial; 95% CI = 95% confidence interval; ACREU = Arthritis Community Research Evaluation Unit; RA = rheumatoid arthritis.							

CONCLUSION

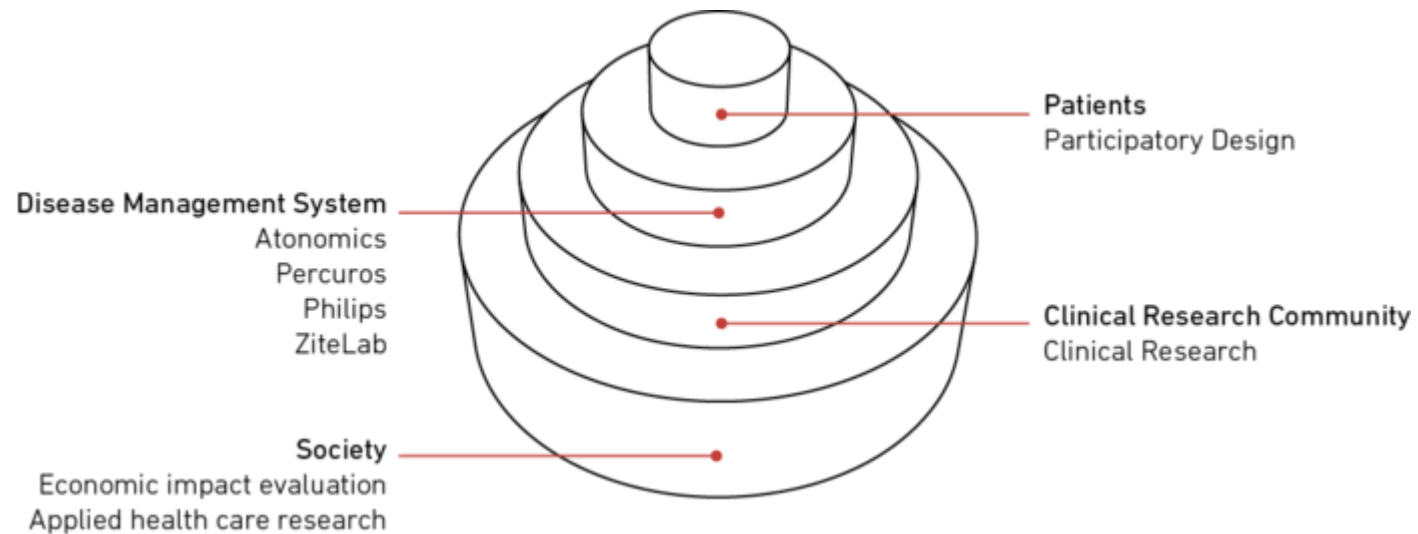
- Champ d'applications vaste et peu exploité
- Amélioration des prises en charge
 - Accès au spécialiste
 - Information/éducation du patient
 - « Tight control »
 - Observance
 - Modification de comportements
 - Thérapeutique?
- Intérêt économique
- Positionnement stratégique et modalités d'évaluation à préciser
 - Rôle des sociétés savantes?
 - Rôle des autorités de santé?
- Evolution vers des outils globaux selon la pathologie
 - Personnalisables
 - Modulables
- Perspectives (exemple)
 - Outil global dans la PR
 - Outils de prise en charge de l'arthrose des membres inférieurs
 - Surpoids, activité physique, exercices supervisés

ELECTOR



ELECTOR

eHealth in Rheumatology



<http://www.elector.eu/home.html>

ELECTOR

Objective

The increasing number of chronic patients in rheumatology calls for further development of the traditional methods for monitoring symptoms. The aim of the ELECTOR project is to develop a web-based ICT platform for home-based monitoring of self-reliant patients with rheumatoid arthritis. This will provide clinicians with a tool that can completely substitute a large proportion of the conventional visits at a rheumatologic outpatient clinic.

The solution will encompass point-of-care devices for the measurement of biochemistry at home and a web-based user interface for reporting questionnaires as well as swollen and tender joints.

The end result is an eHealth solution that will provide an integrated and direct collection of data into patient notes in the setup of an e-Health clinic. This solution will constitute a reliable, safe and straightforward method for obtaining self-assessments and facilitate easy and rapid access to health care assistance at times of need for the individual patient.

<http://www.elector.eu/home.html>