Part A- Cover Page

Title

Multidisciplinary Approach to Patient- physician Partnership In treating to Target in Rheumatoid Arthritis (MAPPIT-RA)

Grant ID#

Collaborators

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Abstract

Despite established guidelines for Rheumatoid Arthritis (RA) management in patients with suboptimal targets, therapeutic intensification does not occur as frequently as expected; potential reasons include that physicians and patients often differ in their assessments of disease activity, parameters shaping physicians' assessments vary, and may not resonate with the patients' perspectives or beliefs of adequate disease control. This may be particularly relevant to Hispanics, the most rapidly expanding ethnic group in the US, incurring unique clinical features, treatment delays, higher disease severity and worse functional outcomes, further compounded by poor health literacy, delayed access to care, low acculturation and sparse resource utilization.

Patient education on determinants of long-term disability, and a better physician grasp of the patient perspective will foster shared decision-making and adherence to the treat to target (T2T) principles.

This proposal aspires to introduce and pilot an integrated, multidisciplinary, patient-centered RA intervention model that capitalizes on a partnership between the patient and the extended Rheumatology Health care team, in order to promote understanding, uptake and adherence to the principles of T2T.

Our Intervention will incorporate a culturally tailored and relevant disease-education framework including goal establishment and tracking, a delivery component capitalizing on interpersonal interaction and a trusting relationship with the care team, prompt evaluation and management of depression, stress and pain coping, physical and behavioral activation, positive thinking, self resilience, and self-empowerment. We aim to empower patients to re-evaluate their outlook on quality of life, enhance their social function, and re-introduce them into the active work force.

Part B- Table of Contents

Part C- Answers to Reviewers Comments

1. One panel member noted that only one of your objectives (#1) was a project objective.
Objective #2 has been restated in the objectives section of the proposal

2. *One panel member was confused why this project only targets the Hispanic population within your clinic and not other patients of low SES.*
Clarification and reasons for Hispanic patient selection has been provided in section 3a of the proposal (under Patients).

3. Another questioned of the 600 unique pts, if only 150 (25%) are Hispanic, or if that is the target sample size for this intervention.
Ethnic composition of the cohort at large and the proposed study population has been described in section 3a of the proposal (under Patients).

4. When describing the professional practice gap it was noted by some that there was no local needs assessment data included; most of the information presented was gathered via a literature review.
Local needs assessment description is reported under "Assessment of need for the project in section 2 of the grant proposal and includes 7 References (plus a manuscript in preparation citation) from our own cohort [under lead author names Karpouzas GA, Moran R, Dolatabadi S, and Withers M]

5. When looking at the project design, one panel member questioned your use of both the CDAI and the Rapid 3.
Closely spaced RAPID3 assessments at home is not intended as a substitute for objective scores such as DAS28 or CDAI, during MD visits. Instead, they provide useful complementary information and act synergistically with those other scores (Kievit W et al. Arthritis Rheum 2006;55:745-50).

6. There were multiple questions related to the randomization. The panel felt there was an insufficient description of how patients would be 'equally divided' into the intervention and control arms. They questioned if there is a randomization scheme. One panel member felt the design should employ randomization or random allocation rather than 'equally divide' approach.
The Randomization method for the proposal is fully outlined and referenced in section 4 (design of outcomes evaluation) under Randomization.

7. One panelist felt it would be difficult to determine if the "education to the patients" or the "weekly monitoring by RAPID-3" will result in "improvement in outcomes" in the IA group.
The potential RAPID3 resulting in improvement will be interrogated, since a clinically significant change in RAPID in 2 consecutive weeks will flag the patient for formal evaluation by the treating MD and re-assessment of therapy.

8. Another panelist felt there was insufficient identification of what constitutes project success (minimally described in the LOI as "significant differences between the interventional and control arms").
A 10% difference in the proportion of patients achieving primary outcome in the intervention arm over control constitutes overall success. Details are outlined under section 4 (design of outcomes evaluation) and power calculations.

Multidisciplinary Approach to Patient- physician Partnership In treating to Target in Rheumatoid Arthritis (MAPPIT-RA)

Part D- Main section of the Proposal

1. Overall Goal and objectives

Goal

To introduce and pilot an integrated, multidisciplinary, patient-centered Rheumatoid Arthritis (RA) intervention model that capitalizes on a partnership between the patient and the extended Rheumatology Health care team, in order to foster understanding, uptake and adherence to the principles of Treat-to-Target strategy in RA; within that construct, we aim to empower patients to re-evaluate their outlook on quality of life, enhance their social function, and re-introduce them back into the active work force.

Objectives

Our site, the adult Rheumatology Clinic at Harbor-UCLA Medical Center in Los Angeles California provides comprehensive health care to mainly low socioeconomic status (SES), immigrant, minority, and largely Hispanic patients.

a. We aspire to provide a platform in which our Hispanic RA patients monitor and advocate for their disease state and needs. To facilitate this, we will COORDINATE interventions which focus on identified gaps in the traditional treat-to-target model, thereby re-envisioning the currently flawed patient experience; using patient-anchored validated metrics, and individualized education as tools to address deficits in health and disease-state literacy, we will enable and define a leading role for the patient over their own disease.
b. We intend to establish a "common language", a mutual understanding of rheumatoid arthritis and its experiences, through exploration and reshaping of illness beliefs, destigmatizing and addressing comorbid depression and inactivity, setting and tracking personal goals, capitalizing on self-resilience, and frequent channeled communication. With this ideological and organizational overhaul we aim to RE-INVENT the patient-physician relationship, initiate an honest dialogue, facilitate a trusting interaction between patients and their support system- the entire Rheumatology care team, and inspire them to internalize and adhere to the principles of a more "global" treat to target initiative.

2. Technical Approach

Assessment of Need for the Project

Hispanics represent the most rapidly expanding demographic in the US (Ennis SR). Recent research by our group and others highlights unique clinical features (Del Rincón I, 2003), treatment delays, higher disease severity and worse functional outcomes in low SES, and Hispanic populations (Molina E1), (Karpouzas GA D. S., 2012), (Moran R & [AB0384], 2012), further compounded by poor health literacy,

delayed access to care, low acculturation and sparse resource utilization. Comorbid depression is highly prevalent (Karpouzas GA D. S., 2012), (Margaretten M, 2011), with 32% of our RA cohort exhibiting at least moderate depression (Karpouzas GA D. S., 2012), represents the pivotal, potentially modifiable predictor of functional disability longitudinally, and heavily contributes to variation of such disability above and beyond disease activity (Karpouzas GA O. S.). Moreover, in our Hispanic population, depression is a robust determinant of change in disability over time, with significant interactions with pain and radiographic damage (Karpouzas GA O. S.) . We further showed that depression mediates the effect of pain on future functional disability (Dolatabadi S, 2011). Additionally, depression may attenuate motivation and adherence to complex, long-term treatment schemes, and stringent therapeutic targets, especially in a population where achievement of disease target does not equal or guarantee better quality of life.

Despite established and accepted (Schoels M, 2010), (de Wit MP1, 2011) guidelines for RA management in patients with suboptimal targets, therapeutic intensification does not occur as frequently as expected (Fraenkel L, 2014). This may be explained to a significant extent by the fact that patients and physicians often differ in their perceptions of disease activity in Rheumatoid arthritis (RA) as described by patients' and evaluators' global assessments (PGA and EGA respectively), (Studenic P, 2012), (Khan NA1, 2012), (Barton JL, 2010). We recently evaluated determinants of PGA and EGA and their proportionate contributions in 333 Hispanics with RA and regular follow up at our center (Karpouzas GA D. T.). We further explored predictors of significant discrepancies between PGA and EGA, and interrogated the frequencies of concordant and discordant assessments of changes in PGA and EGA longitudinally. Our models explained 66% of variability in PGA and 83% of the variability in EGA. Main, multivariate determinants (and proportionate contributions) for PGA were fatigue (23.7%), pain (21.2%), depression (18%), and sedimentation rate- ESR (3.2%). EGA was mainly predicted by swollen joint counts (44.4%), tender joint counts (30.2%), ESR (5.2%) and fatigue (3.5%). Importantly, PGA but not EGA was associated with gainful employment (Karpouzas GA G. T.); those employed had lower PGA (3.8± 2.8 vs. 5.0± 2.9, p=0.001). Additionally, PGA predicted absenteeism in those employed, and was directly and independently linked with activity impairment regardless of employment status [B (95% CI) of 1.8 (0.5-3.2), p=0.009] (Karpouzas GA G. T.)

Concordance in evaluations of global disease activity (PGA-EGA<2 cm in a visual analogue scale) was observed in 142 (43%), higher patient ratings in 147 (44%), and higher physician ratings in 44 (13%). Fatigue and pain predicted higher patient ratings [OR (95% CI) of 1.3 (1.1-1.5) and 2.1 (1.2-3.5) respectively], while swollen joints, tender joints, and prednisone use predicted higher physician ratings [OR (95% CI) of 1.3 (1.2-1.5), 1.2 (1.1-1.3), and 3.1 (1.2-8.6) respectively] (Karpouzas GA D. T.). At follow up, EGA improved in 31.7%, remained unchanged in 50.9% and worsened in 17.4%. Respective trends for PGA were 28.6%, 44.1% and 27.3%. The lowest concordance was seen for worsening disease, where PGA showed only 27% concordance with the EGA, compared to 59% and 52% for unchanged or improved disease respectively. These findings indicated to us that highly divergent parameters and considerations shape patients' and

physicians' perceptions of disease activity in Hispanics with RA in the US; fatigue and pain contribute mainly to higher patient assessments, while swollen and tender joint counts predict higher physician assessments. From the patient's perspective, physician-based T2T parameters and principles may not be as relevant or convincing as triggers for therapeutic escalation as are subjective beliefs of adequate control, intention to preserve control, or fear of loss of such control (rather than improvement) at any given time (Wolfe F, 2007). Maladaptation to the disease state may also disincentivise compliance with T2T, as crucial illness beliefs regarding symptom burden, emotional impact, and consequences on life may shift, favoring a "do less" attitude despite high disease activity (Fraenkel L, 2014). Patient education on what disease parameters lead to long-term disability, and a better physician grasp of the patient perspective will likely foster shared decision-making and adherence to the treat to target principles. Therefore, an intervention for successful implementation of T2T strategy in Hispanics with RA would have to incorporate a culturally tailored and relevant disease- education framework including goal establishment and tracking, as well as a delivery component capitalizing on interpersonal interaction and a trusting relationship with the care team, prompt evaluation and management of depression, stress and pain coping, physical and behavioral activation, positive thinking, self resilience, and self-empowerment (Withers M, 2015).

3. Project Design and Methods

a. Patients

The Adult Rheumatology clinic at Harbor-UCLA provides regular, comprehensive health care to 600 unique patients with RA. The vast majority of subjects are low SES, 72% are Hispanic, 13% are African American, and the remaining 15% are Asian, Caucasian, and Pacific Islander. Based on data acquired so far, vast experience from previous work with Hispanics, robustness of numbers allowing sample calculations, and observed ethnic trends for willingness to participate in clinical trials in our center, we decided that the focus of this proposal should be our Hispanic population.

Inclusion Criteria

Latino patients who: (a) are over 18 years of age, (b) fulfill 2010 diagnostic criteria for RA, (c) are able and willing to sign informed consent, (d) have at least moderate disease activity based on both a clinical disease activity index (CDAI)>10 will be invited to participate.

Exclusion Criteria

Patients with (a) overlapping or mixed connective tissue syndromes, (b) functional class IV RA, (c) known irreversible articular damage including subluxations, arthrodesis, fusion, or prosthesis, or (d) Intercurrent illness or comorbidity interfering with full treatment potential (chronic infections, malignancy, advanced or decompensated heart failure) will be excluded.

Harbor-UCLA Medical Center utilizes electronic medical record (CERNER) and all RA patients with follow-up at the adult rheumatology clinic are databanked. All patients

in the database will be therefore be pre-screened electronically for inclusion and exclusion criteria and potential candidates will be approached with study details at their regular outpatient visits for interest to participate and formal screening. One hundred and fifty Hispanic RA patients will be recruited for this proposal and randomized 1:1 to Intervention (IA) and Control (CA) arms for a period of 12 months (Figure 1).

b. Study outcomes

Percentage of patients in remission based on (a) Clinical Disease Activity Index (CDAI<2.8) and (b) Routine Assessment of Patient Index Data (RAPID-3 ≤1) evaluation at 6 months will constitute co-primary outcomes. Several secondary outcomes will be assessed: i. proportion of subjects in CDAI and RAPID-3 remission at 12 months; ii. Percentage of patients with low CDAI (<10) and low RAPID-3 (≤2) at 6 and 12 months; iii. Proportion of patients with clinically significant and meaningful change (>MCID) in PROs (HAQ-DI, PHQ-9, FACIT, pain, PGA, SF36, WPAI) at 6 and 12 months (elaborated upon in the statistical analysis section); iv. Numbers of evaluator adjudicated disease flares (CDAI increase > MCID of 5 points) and patient reported flares (RAPID-3 increase > MCID of 1.2 points) at the end of study based on assessments at the pre-specified visits at 0, 3, 6, 9, and 12 months.

c. Description of Evaluator and Patient reported outcomes

RA disease activity will be captured as Clinical Disease Activity Index (CDAI)- based on both physician and patient reported outcomes- and with the RAPID-3, based exclusively on patient reported outcomes. Evaluator Global Assessment of disease activity (EGA), Patient Global Assessment of disease activity (PGA), pain, and Fatigue will all be evaluated with visual analogue scales (VAS-10cm). Physical function will be assessed via the 2-page Spanish version of the Stanford University Health Assessment Questionnaire-Disability Index (HAQ-DI). Quality of life evaluation will be done with the Spanish translated SF-36 version 2, which includes eight domains [physical functioning (PF), role limitations—physical (RP), bodily pain (BP), general health perceptions (GH), vitality (VT), social functioning (SF), role limitations—emotional (RE) and mental health (MH)], scored from 0 (worse) to 100 (best). These domains will be combined into Physical Component Summary (PCS) and Mental Component Summary (MCS) scores, with a normative mean (S.D.) of 50 (Kremer JM). Work productivity will be evaluated with the Work Productivity and Activity Impairment questionnaire (WPAI). Depression will be evaluated with the Spanish translated version of the Patient Health Questionnaire 9 (PHQ-9), provided by the authors of the Patient Health Questionnaire and available for public use (http://onlinelibrary.wiley.com/doi/10.1002/acr.22462/Abstract). Total scores range from 0 to 27 and correspond to depression severity levels: minimal (0–4), mild (5–9), moderate (10–14), and moderately severe to severe (≥15). The suitability of this instrument to identify depression in various racial/ethnic backgrounds has been reported (Huang FY, 2006), (Gilbody S, 2007), (Williams JW Jr, 2002), (Wulsin L, 2002). Moreover, we recently interrogated the reliability and validity of the PHQ-9 instrument

for assessment of Depression within our own cohort of socioeconomically disadvantaged Hispanics with RA, since its measurement properties have not been adequately assessed in this patient group (manuscript in preparation). In a sample of 447 Hispanics with RA, the internal consistency of the PHQ-9 was very good (Cronbach's $\alpha = 0.91$) and all corrected item-total correlations reached an acceptable level. Confirmatory Factor Analysis (CFA) showed that a one-factor solution provided a good fit to the data: S-B$\chi^2(27) = 67.85$, $p < .05$, CFI = .971, TLI = .961, RMSEA = .058 with all significant factor loadings. Multi-group CFA demonstrated that the factor structure can be generalized across age groups, RA disease duration and levels of disease activity. Convergent validity was supported by significant associations of total PHQ-9 scores and severity levels in the expected directions with theoretically related measures such as SF-36 physical and mental components, fatigue, functional disability, activity impairment in the WPAI, pain, PGA, and EGA (all with $p<0.001$). These findings support the utility and reliability of the PHQ-9 instrument as a brief and low-burden screen for depression in socioeconomically disadvantaged Hispanics with RA (manuscript in preparation).

d. Study Design

Subjects in both intervention and control arms will be evaluated by their assigned Rheumatologist at 0, 3, 6, 9, and 12 months; evaluator outcomes (EROs), including tender (TJC), swollen joint counts (SJC), inflammatory indices, and EGA will be collected. Single item health literacy (SILS), Brief Illness Perception (BIPQ) screening, and patient reported outcomes (PROs) including RAPID-3, disability (HAQ-DI), depression (PHQ9), fatigue (FACIT-VAS), pain, PGA, quality of life (SF-36), and work productivity assessments (WPAI) will be collected at 0, 6, and 12 months with the help of a bilingual study/ health care coordinator (Figure 1 and Table 1). At baseline, subjects in both arms will receive instruction on proper completion of the RAPID-3 survey, Spanish-translated brief, general disease state educational pamphlets through Arthritis Foundation, and verbal screening for depression. Patients in the CA who report being depressed will receive a standard of care mental health evaluation referral. Patients in the IA will be additionally offered (a) a personally tailored, comprehensive educational component one-on-one with a trained Rheumatology nurse (induction, below), (b) a standard in-clinic psychological evaluation for a PHQ9 score>10 -regardless of verbalization of depression- as well as (c) in-clinic Physical Therapy evaluation for physical function assessment, graded exercise goals, and joint protection guidance. Subsequent psychological and physical therapy evaluations will occur as directed by the individuals services, including the times of scheduled follow-up provider visits. In between scheduled provider visits (0,3,6,9,12 months), patients in both groups will complete weekly (same day) RAPID-3 assessments at home and promptly transmit them (fax or email) to the health care coordinator; This individual will quickly review, perform quality control, and contact patients with queries as needed to assure correct completion of the survey and data fidelity.

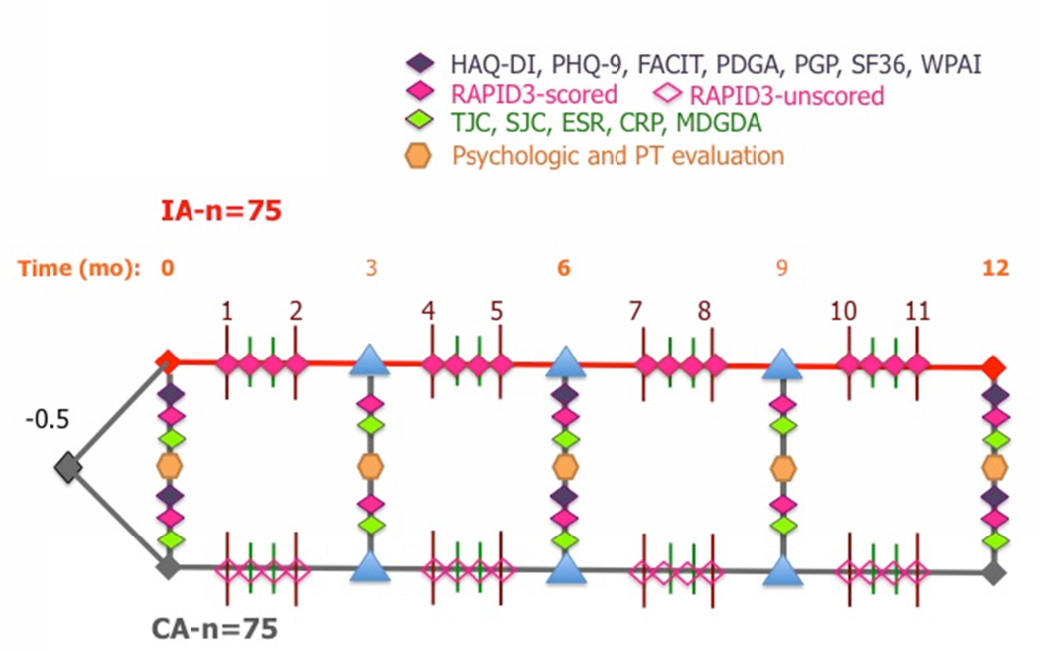

Figure 1: Trial Design

Table 1	Scheduled Interventions	IA	CA
Baseline	Instruction on RAPID3 completion	☑	☑
	Pamphlets on disease state education	☑	☑
	Personally tailored, Educational component (Induction)	☑	
	Verbal screening for depression	☑	☑
	Psychology Evaluation for PHQ9>10	☑	
	Physical Therapy Evaluation	☑	
Weekly Patient	RAPID3 submission (FAX/ email)	☑	☑
Health Care Coordinator	RAPID3 review, Ad-hoc phone call for queries, quality control of RAPID3	☑	☑
	RAPID3 scoring	☑	
	Ad-hoc MD visit scheduling for ⇧RAPID3 in 2 consecutive weeks and a cumulative >1.2 total points from prior	☑	
Monthly Health Care Coordinator	Scheduled phone call with patient- content defined below	☑	☑
	Weekly outcome compilation, quality control	☑	
	Ancillary service data and report integration and f/u	☑	
	Educational piece consolidation	☑	
	Review patient goal status and update	☑	
	Pedometer data update and goal advancement	☑	

RAPID-3 surveys will be scored immediately in the IA, but not until the end of the study in the CA; if a consistent, clinically significant, cumulative score increase (>MCID of 1.2) over 2 consecutive weeks is observed, patients will be scheduled for an adhoc evaluation with their assigned provider.
Subjects in both groups will also have a regularly scheduled monthly phone call with the health care coordinator. In the CA the content will be restricted to queries on fidelity of RAPID-3
survey data collection, or patient questions and concerns; IA patients will further receive educational segment consolidation (below), discuss personal goal status and advancement, ancillary service report communication and integration, and exercise goal advancements, all facilitated by the health care coordinator.

Intervention elements

i. Educational Component

The educational component framework for the IA will encompass four main domains described in Table 2 below (Zangi HA1); a. general disease state education, incorporating pictograms and short slide presentations downloaded and adapted form the Arthritis Foundation website; b. introduction of T2T concept, including significance, proof of concept evidence, and sanctioning the patient as an equal partner by proposing ways of engagement and facilitation; c. Treatment options, time frames, and patient prospects; and d. establishment of patient goals and expectations for the duration of the study, empowering and further committing the patient to this strategy. The relative focus on those domains, especially in the consolidation phase administered monthly, will vary based on subjects' Single Item health Literacy (SILS) (Caplan L, 2014) and Brief Illness Perception (BIPQ) (Broadbent E, 2006) screening scores.

		Table 2: Domains and Item description of Educational Intervention component
Baseline- Induction	**Disease State education** (Based on materials from the Arthritis foundation website, including pictogram) http://www.arthritis.org/about-arthritis/types/rheumatoid-arthritis/	What is Rheumatoid arthritis
		Why did it happen to me?/ what caused it?
		What do I have to look forward to?
		Can I treat it/ cure it?
		Nutritional guidelines (things to avoid that may cause inflammation)
Consolidation- monthly (as needed)	**MD Goals of treatment- a partnership with the patient**	T2T concept delineation - why is it important? [EULAR recommendations for patient education for people with inflammatory arthritis: Zanghi HA et al. doi:10.1136/ annrheumdis-2014-206807]
		What does it entail? ◆ Assessment of Rx efficacy q3 mo and adjustment based on target after mutual decision ◆ Assurance that the patient "can do better"
		How can the patient facilitate implementation? ◆ Full comprehension of the objective ◆ Commitment to personal monitoring ◆ Adherence to treatment plan ◆ Communication with the rheumatology team
	Treatment specifics	Medication choices by disease state and stage, benefits, drawbacks
		Time frames and magnitudes of anticipated responses
	Patient goals of treatment	Delineate a list of goals you want to achieve in the next 12 months (@ baseline)/ monthly review
		What is acceptable to you (the patient) of the MD outlined goals list
		What will it take for you to commit to the T2T approach?

ii. Psychological Evaluation and intervention

At baseline evaluation, RA patients in the intervention arm with PHQ9 scores>10 indicating moderate depression, will receive a formal psychological evaluation, commensurate with their clinic visit. In collaboration with the Harbor-UCLA Medical Center Department of Psychiatry, Division of Psychology, a Psychology Fellow assigned to the project will evaluate patients identified as meeting criteria for depression and will make treatment recommendations. Such recommendations may result in following the patient for ongoing consultation and brief treatment in the Rheumatology Clinic, providing weekly, individual care to patients utilizing Cognitive, Behavioral, Mindfulness, Pain Management, or other evidence-based treatments in the Behavioral Medicine office at Harbor-UCLA Medical Center, linking patients to other psychiatry services (e.g., psychotropic medication, psychodiagnostic testing, etc.), and working with patients to prepare them for engaging any of the possible disposition pathways noted above. The treatments to be utilized will be culturally sensitive and tailored to the population of interest. The Psychology Fellow will deliver best practices treatments for the under-represented ethnic and linguistic minority populations served by the Rheumatology Clinics by focusing on applying treatments in a manner that accounts for the patient's ethnic-

cultural history in order to maximize the patient's understanding and application of the treatments they will be receiving.

iii. Physical Therapy evaluation and Intervention

Baseline Physical Therapy evaluation will be offered in the Intervention Arm. The evaluation will include physical function assessment, establishment of home exercise goals and program, and joint protection guidance. At the same time a pedometer will be dispensed along with instructions for use, and guidance on gradual increase of such goals will be provided. Such goals will be re-evaluated on follow-up appointments as directed by the physical therapist, including the times of scheduled follow-up provider visits. In the control arm, Physical Therapy referral and evaluations will occur in a standard of care fashion as needed for addressing specific problems.

4. Design of outcomes evaluation

Power calculations

Our baseline data in 333 Hispanics with RA reveal that 10.7% of those with at least moderate disease activity at baseline based on CDAI>10 achieve disease remission (CDAI≤2.8) at a median of 12 months. Sample size determination and power analysis was calculated assuming 10.7% of patients in the CA and at least 20.7% in the IA (+10%) would achieve CDAI remission at 6 months. Using a two-tailed α of 0.05, a sample size of 123 participants will provide adequate power (.80) to detect a 10 percentage point difference in the increase in CDAI remission rate in the IA compared to the CA. Assuming a 15% attrition rate, we aim to enroll 150 patients (75 in each group). Power analyses were conducted with G*Power 3 (Faul F, 2007).

Randomization

Subjects will be randomly assigned 1:1 into Intervention and Control arms using a minimization protocol (Taves DR, 1974), (Pocock SJ, 1975). This adaptive randomization scheme is recommended to help reduce the likelihood of imbalance between arms in small to medium sized studies of diseases like RA that are associated with a number of prognostic markers. In the proposed study, randomization will be conducted by a project biostatistician using a SAS two-group minimization allocation macro (Dmitrienko A) to balance intervention arms with respect to relevant prognostic factors.

Statistical analysis

The main analysis will test the hypothesis that a larger proportion of participants in the IA will achieve remission on the CDAI and RAPID-3 relative to CA participants. Proportions of participants achieving CDAI and RAPID-3 remission will be evaluated using chi-square analyses (Fisher's exact test if each cell counted < 5). Primary outcome analysis will be an intention-to-treat- (ITT), so patients who withdraw will be considered non-responders from that time point onwards. Secondary outcomes will be assessed using linear mixed effects models with treatment arm as a between-groups factor and

measurement occasion (baseline, 6 months, and 12 months) as a within-groups factor. Planned contrasts will be used to compare changes from baseline at 6 months and 12 months within each treatment arm. Post hoc analyses will examine the proportions of patients in each treatment arm who demonstrate improvement exceeding the Minimally Clinically Important Differences (MCID) change threshold in each secondary outcome. MCID thresholds have been reported both for evaluator and patient reported outcomes; >5 points for CDAI (Curtis JR), >1 cm for PGA and EGA-VAS (Wells GA, 1993), (Dworkin RH, 2008), (Strand V, 2011), ≥0.22 of HAQ-DI (Wells GA, 1993), ≥1 cm for pain (Wells GA, 1993), (Dworkin RH, 2008), (Strand V, 2011), ≥2.5 points in SF-36 PCS and MCS and ≥5 points in individual SF-36 domain scores (Lubeck DP, 2004). The MCID for fatigue VAS is −1.12cm for improvement and 1.26cm for worsening on 0–10 scale (Khanna D1, 2008).

Target audience Engagement

Engagement of the target audience will be assessed through tracking study and treatment adherence, including completion of weekly surveys, participation with monthly communications, regular appointment attendance, and continued participation and completion of the study. Patient satisfaction with treatment will be evaluated post-intervention using the Functional Assessment of Chronic Illness Therapy- Treatment Satisfaction- Patient Satisfaction (Peipert, 2014). Additionally, post-intervention open-ended feedback will be solicited from participants in the treatment arm regarding their experiences with the intervention, which will be used to inform further refinement and improvement of the intervention.

Dissemination

Upon successful implementation of this intervention within our County-based hospital, the intervention will immediately be disseminated as a model system for comprehensive approach to RA management to three university-affiliated rheumatology centers who care for lower SES and minority populations in Los Angeles County, as well as throughout the Department of Health Services system of community clinics. A toolkit comprised of training resources, intervention protocols, materials such as the educational manual and a guide to implementation will be provided to interested clinics and organizations, and members of the project team will be available for consultation. The toolkit will also be made available online through dissemination websites such as www.hipxchange.org (The University of Wisconsin Health Innovation Program). Information about the intervention will be publicly available online on the Harbor UCLA website. Additionally, manuscripts summarizing results of the study will be submitted for publication in peer-reviewed journals that have a wide readership in the rheumatology community. Study findings will also be presented at national and international rheumatology conferences, including the annual meetings of the American College of Rheumatology European League Against Rheumatism.

5. Innovation

We propose an ideological and organizational overhaul to the traditional care model, that incorporates core principles addressing gaps identified by members of our predominantly low SES Hispanic population (Withers M, 2015), for whom disease target attainment does not equal improved quality of life, and for whom no such intervention currently exists (Karpouzas GA D. S., 2012). We seek to establish a common language which overcomes barriers of educational accomplishment, health literacy and ingrained illness beliefs, integrates and destigmatizes comorbid depression and physical disability, empowers patients to track, identify, and communicate their daily experience, and capitalizes on self-resilience, in an effort to reduce the impact of RA (Withers M, 2015).

6. Detailed Work plan and Deliverables Schedule

Total project timeline is estimated at 32 months (Table 3). This includes a 3-month set-up period (months 0-3) for personnel hire, including a health care coordinator, study nurse assistant, data entry clerk, Psychology Fellow, physical therapist, and statistician. The same period of time will be used for final educational content development, educational manual printing, training of participating medical faculty, health care coordinator and study nurse on study protocol, manual content delivery and study procedures. IRB submission and approval will occur in that time frame as well. The next 12 months (months 4-16) will comprise the study enrollment period. Months 17-29 will comprise the actual 12-month study period during which the aforementioned intervention will be delivered. Finally months 30-32 will encompass the data analysis period, abstract and manuscript preparation and data presentation phase of the study.

Table 3: Timetable of Deliverable Items	0-3 months	4-16 months	17-29 months	30-32 months
Finalize educational content development	☑			
Educational manual Printing	☑			
Study personnel hire	☑			
Medical Faculty and study personnel training on study protocol, related procedures, and educational content delivery	☑			
IRB preparation, submission and approval	☑			
Study Enrollment period		☑		
Study delivery period			☑	
Data analysis period				☑
Abstract and manuscript preparation				☑
Results presentation and publications				☑

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