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Implementation of Treat to Target in Rheumatoid Arthritis through a Learning Collaborative: Rationale and Design of the TRACTION Trial

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Abstract

Background/Purpose—Treat to target (TTT) is a recommended strategy in the management of rheumatoid arthritis (RA), but various data sources suggest that its uptake in routine care in the US is sub-optimal. Herein, we describe the design of a randomized controlled trial of a Learning Collaborative to facilitate implementation of TTT.

Methods—We recruited 11 rheumatology sites from across the US and randomized them into two groups: one received the Learning Collaborative intervention in Phase 1 (month 1–9) and the second formed a wait-list control group to receive the intervention in Phase 2 (months 10–18). The Learning Collaborative intervention was designed using the Model for Improvement, consisting of a Change Package with corresponding principles and action phases. Phase 1 intervention practices had 9 learning sessions, collaborated using a web-based tool, and shared results of plan-do-study-act cycles and monthly improvement metrics collected at each practice. The wait-list control group sites had no intervention during Phase 1. The primary trial outcome is implementation of TTT as measured by chart review, comparing the differences from baseline to end of Phase 1, between intervention and control sites.

Clinical Trials Registration: NCT02260778

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Results—All intervention sites remained engaged in the Learning Collaborative throughout Phase 1, with a total of 38 providers participating. The primary trial outcome measures are currently being collected by the study team through medical record review.

Conclusions—If the Learning Collaborative is an effective means for improving implementation of TTT, this strategy could serve as a way of implementing disseminating TTT more widely.

INTRODUCTION

Randomized controlled clinical trials have demonstrated that a strategy of treating to target (TTT) results in better outcomes compared with usual care. The TTT strategy is based on a number of principles and recommendations as recently articulated by an international working group.(1, 2) These include: identification of a disease activity target for treatment with patients using shared-decision making; selection of remission or low-disease activity as the target for most patients; measuring disease activity regularly to assess whether patients have achieved target; and adjustment of treatments if patients are not at target and there are no extenuating circumstances. While trials of TTT have not been very large and have included slightly different treatments and different targets, they have consistently found better function and less pain among subjects in the TTT treatment arms.(3–10) Patients in the TTT arms did not experience worse side effects than others. Several trials also noted reduced progression in radiographic measures.(3, 11)

The TTT strategy has been embraced by the American College of Rheumatology through the RA Treatment Guidelines (12) and by EULAR,(13) however several lines of evidence suggest that TTT is not practiced consistently across rheumatology settings. The largest US-based RA registry, CORRONA, examined the management of patients in moderate disease activity with poor prognosis or high disease activity.(14, 15) Despite having active disease, approximately one half received treatment changes over the subsequent 6–12 months. A large Australian cross-sectional study examined reasons rheumatologists do not adjust RA treatments at visits where patients were found to be in moderate or high disease activity.(16) The investigators found several common reasons that treatments were not escalated, including patient choice to not adjust treatment; rheumatologist decisions that structural damage was irreversible or that pain was felt to be from non-inflammatory causes; or essentially unexplained decisions by rheumatologists to not change treatments.

In preparation for this trial, the Principal Investigator (DHS) conducted 12 qualitative interviews with rheumatologists, examining the use of TTT and explored possible barriers. Results of these structured interviews revealed that all providers believed that they were engaging in TTT; however, only 3 (25%) of 12 providers regularly assessed a disease activity measure, 4 (33%) of 12 routinely documented a treatment target as part of the plan in the medical record, 1(9%) of 12 engaged patients in determining the appropriate target, and 2 (18%) of 12 described reasons for not modifying treatments in the medical record. The interviews suggest that almost none of the interviewees were actually following a TTT strategy.

Treat to target is a patient management strategy that requires health care delivery redesign for many providers. Implementation of TTT requires the coordinated effort of a

rheumatology practice with providers, medical assistants, other staff, and patients all working together. With the goal of improving the implementation of TTT in typical US rheumatology practice, we considered various methods for improving the care process. One approach found successful in the past is a Learning Collaborative (also known as a Breakthrough Series Collaborative).(17) It consists of sequenced learning sessions where teams and expert faculty exchange knowledge and brainstorm ideas, and action periods where teams test and implement changes in their own practices. This method facilitates a local “test, learn and share” approach where the participants conduct small tests of change at their individual sites and then teach other sites what has worked. The faculty teach the process, develop the principles underpinning the Learning Collaborative and give teams regular and supportive feedback. Teams use the Model for Improvement approach by focusing on specific, measurable changes and spreading successful interventions to the organization-wide level.(18)

This paper describes the rationale and design of the TRACTION (Treat-to-target in RA: Collaboration To Improve adOption and adhereNce) Trial that tested the effectiveness of a Learning Collaborative to improve implementation of TTT for RA in rheumatology practices.

METHODS

Trial Design

We designed a randomized controlled clinical trial to test the effects of the Learning Collaborative for TTT. Randomization occurred at the site level since the intervention targeted practices, not patients or individual providers. Randomizing medical sites or providers is an efficient method to disseminate a practice improvement intervention and reduces contamination, but it has implications for statistical power (see below). Masking of sites and their providers is impossible in this type of practice redesign experiment.

One group of sites was randomized to receive the Learning Collaborative intervention during the first nine months (Phase 1) and the other group received the Learning Collaborative during the second nine months (Phase 2) (see Figure 1). During Phase 1, the group not receiving the Learning Collaborative served as the wait-list control group. The results of Phase 1 will be reported as the main results of the randomized controlled trial (see Statistical Analysis section below); the *main study hypothesis* is that sites randomized to the Learning Collaborative will implement TTT to a greater extent than sites randomized to the wait list control.

By designing this study with a second phase, two important secondary analyses can be pursued. First, we will be able to compare the Learning Collaborative results among teams receiving the intervention in Phase 1 versus Phase 2. For this comparison, we *hypothesized* that the improvements in TTT implementation will be larger during Phase 2 than in Phase 1 for several reasons: enhanced experience of the study team leading the Learning Collaborative; sharing of successes and lessons learned from phase 1 sites (including small tests of change); and increased experience of the study team with change methods, quality improvement, and implementation science. Second, we will assess the sustainability of the

changes achieved by the Phase 1 Learning Collaborative intervention sites. We *hypothesized* that adherence to TTT (this could also be described as implementation) will decrease from the end of Phase 1 through the end of Phase 2.

All aspects of the trial were reviewed and approved by the appropriate Institutional Review Boards.

Recruitment and Randomization

We required sites to have at least two rheumatic disease providers; this could be multiple physicians or a physician and a mid-level provider (e.g., nurse practitioner and/or physician assistant). We offered sites a small honorarium (\$4,000) for participation in both phases of the trial (18-months); the sites had to commit to over 20 hours of internal meetings, a one-day face-to-face meeting, and participating in the monthly learning sessions that included collecting improvement measures.

The recruitment targeted rheumatology sites with multiple providers from all regions of the US. We reached out to rheumatology sites that were not based in large research centers. Thus, we attempted to avoid providers who saw few patients, as their experience in the Learning Collaborative may not generalize well to typical practices. The most fruitful recruitment was with smaller rheumatology training programs where most clinicians practiced full-time. Many of the sites recruited had trainees who were required to participate in quality improvement projects as part of their fellowships.

We initially aimed for 12 sites in total (6 per arm) but ended up with 11 after one dropped out. Sites were screened during a telephone interview to determine that they did not already use TTT routinely; none interviewed were excluded based on this criterion. The sites were randomized into the two arms – 5 in Learning Collaborative intervention and 6 in wait-list control for Phase 1. While our primary outcome is implementation of TTT, we are also interested in comparing patient disease activity across the two arms. This requires that sites routinely document disease activity measures in their medical record. We anticipated that the sites in the Learning Collaborative intervention during Phase 1 would begin this practice. However, to ensure that there were sites in the wait-list control arm with disease activity measures documented, we performed stratified randomization, with the 4 sites that reported using disease activity measures at baseline randomized equally to each arm.

Intervention

We pursued a Learning Collaborative intervention because most barriers to implementing TTT were based on process of care within a given practice, and not a simple educational deficit. As we note above, the Learning Collaborative involves expert faculty providing guidance to teams through learning sessions and action periods.⁽¹⁷⁾ Teams work on process improvement through testing small changes, observing effects, and adopting what works. Tests of change are arranged as several day cycles with faculty teaching the process and providing regular support and feedback. Teams focus on specific metrics and spreading successful interventions to the broader provider group.⁽¹⁸⁾

Implementing TTT requires a modified RA treatment discussion for some providers and a change in documentation. Since the target is based on standardized disease activity measures, the practice needs to select a measure and then use it routinely at all visits. There are various accepted disease activity measures that put different demands on the practice; some can be assessed by patients without the provider and others require more input from providers.(19) Sites were able to choose which disease activity to assess out of the accepted measures. Finally, providers need to respond to the disease activity measure when the target has not been reached. This requires adjustment of treatment or documentation of why no changes were made.

Due to the geographic spread of the participating sites, we pursued a mostly virtual Learning Collaborative versus a traditional collaborative format (typically involving three multi-day in-person meetings).(20) Thus, we designed a Learning Collaborative describing the Change Package, principles and concepts (see Figure 2). The three principles of the Change Package followed directly from the required processes of care and the concepts support the principles.

The first Learning Session was a one-day face-to-face meeting that consisted of orienting the teams to the Model for Improvement,(18) describing the Change Package and its content (see Figure 2), conducting team building activities focused on developing ideas for plan-do-study-act (PDSA) cycles, and cross-team learning activities. (The PDSA cycles refer to tests of change, using four stages, that are performed as part of a quality improvement process. (21)) The day primarily consisted of discussion sessions, and several lectures on TTT, disease activity measures, and shared decision making helped orient teams to the Change Package contents. The Change Package described concepts that underpin each Principle. The concepts were often the subject of a PDSA cycle, allowing teams to chart their progress within the Change Package. Each one of the study team members contributed and approved the Change Package but no patient input was sought. There was ample time for teams to get feedback from expert faculty on their proposed tests of change that would promote implementation of TTT, and to discuss results to date. Subsequent Learning Session were conducted via webinar. The schedule of Learning Sessions and their content are shown in Table 1. We asked all team members from each site to attend these calls but this was not always possible. All Learning Sessions were recorded and made available on the web-based collaborative tool (see below).

We developed a web-based collaborative tool for the Learning Collaborative (see Supplemental Figure). It helped manage contents being shared across teams (i.e., key resources, PDSAs), displayed monthly improvement metrics, and provided a discussion board with conversation “threads.” The tool was used in all Learning Sessions.

Trial Outcomes

We planned to examine a range of outcomes related to the Learning Collaborative intervention. The primary outcome was the change in implementation of TTT from baseline through the end of Phase 1. We defined it as the proportion of visits implementing TTT (see below) and compare these proportions at the two time points across the intervention and control groups (see **Statistical Analysis section**). Implementation of TTT will be measured

using a medical record review tool developed for this project (see Supplemental Table and Results for reliability). The tool had four items: 1) documentation of a treatment target; 2) documentation of shared decision making; 3) documentation of a disease activity measure; and 4) evidence that this information guided treatment decisions. Thus, each visit note can be graded to have none of these items present through all four items present.

This tool was used to grade the visit in the two months immediately prior to the start of Phase 1 and the visit in the two months immediately prior to the end of Phase 1; a change score between baseline to follow-up will be calculated. The range of change in implementation of TTT can vary from -4 (worsening from 4 at baseline to 0 at follow-up) to +4 (improvement from 0 at baseline to 4 at follow-up). Thus, the range of change scores will be from -4 to +4, a 9-point ordinal scale.

Secondary outcomes considered implementation of TTT in two other ways:

1. improvement in implementation (i.e., any positive change in implementation score) versus no improvement between baseline and follow-up (i.e. change of zero or negative score), and
2. implementation of all four TTT items at the follow-up (i.e., a score of 4 at follow-up or “fully implemented”).

The baseline visit was considered the patient visit within two months before the start of Phase 1 (January 2015). If there are multiple visits in this timeframe, then the note for the visit most proximal to January 2015 (start of the study) will be assessed. The end of Phase 1 visit was considered the visit within two months before November 1, 2015. Again, if there were multiple visits in this timeframe, then the note for the visit most proximal to October 1, 2015 was assessed. When assessing the performance at each site, we randomly sampled the medical records of patients with RA who have visits documented within these two timeframes.

Other secondary outcomes included disease activity, resource use, adverse events, and patient satisfaction with provider communication, all assessed through independent review of the medical record. Disease activity measures for RA all permit categorization of the scores into remission, low, moderate, and high disease activity. As noted, several of the sites collected disease activity measures before the start of Phase 1. These sites were allocated to treatment arms using stratified randomization to ensure that several control sites would have disease activity measures noted in the chart. The disease activity measures were assessed at the baseline visit and the end of Phase 1 visit and a change score calculated per patient based on the four categories noted above. These change scores were compared across the intervention group sites and the control group sites with the disease activity measures.

Resource use was assessed by examining all visits for RA during the nine months of Phase 1. We examined the number of visits for RA, hospitalizations for RA, the RA treatments used, the laboratory tests ordered, and the diagnostic imaging pursued. In a similar fashion, we examined all visits during Phase 1 to assess for possible medication related adverse events, such as rashes, oral ulcers, alopecia, infections requiring antibiotics, liver toxicity as manifest by abnormal liver function tests and/or abnormal liver imaging, lung toxicity as

manifest by abnormal imaging, cytopenias as manifest by complete blood counts below the lower limits of normal, renal insufficiency defined as a 50% decrease in creatinine clearance, cancer, and gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea, unexplained weight loss, or dyspepsia).

Finally, we randomly selected RA patients at each site to complete a questionnaire rating their satisfaction with the shared decision-making process using the three item collaboRATE scale.(22) This was carried out at the start of Phase I and will be re-assessed at the end of Phase 1. Similarly, we asked providers involved in the Learning Collaborative from all sites in both groups to complete a modified version of this questionnaire; this will also be re-assessed at the end of Phase 1.

During Phase 2, the only outcomes to be assessed are the primary outcome of TTT implementation as well as the patient collaboRATE scale. As well, a secondary post-hoc analysis examined whether different disease activity measures were associated with implementation of TTT.

Statistical Analysis Plan and Sample Size Estimation

The primary analysis compared the primary outcome among the Learning Collaborative sites with the control sites. The mean change in implementation of TTT for the Learning Collaborative arm compared with implementation of TTT for the control arm after accounting for intra-cluster correlation using linear mixed models. Although the normality assumption may be violated when the outcome variable is ordinal, linear mixed models should still be valid for the proposed sample size.(23) Treatment arm was the exposure of interest. Covariates included in the model included provider-level characteristics (such as age, gender, training), patient-level characteristics (age, gender, baseline disease activity, baseline RA drugs, disease duration), and other covariates found to be unbalanced at baseline. While these characteristics should be balanced given the random assignment to treatment arm, the small number of centers in each arm opens the possibility of baseline differences and thus the rationale for adjustment. Similarly, for the secondary outcomes (dichotomous variables), we used generalized linear mixed models for binary outcomes.(24)

The trial was powered based on the primary outcome – the estimated difference in change in TTT implementation between the Learning Collaborative intervention and the control sites. Several other assumptions underpin the sample size estimation. First, the control group would have no or only small change (0–5%) change in implementation of TTT compared with a change in the intervention group of 20–40%, an improvement level observed in a similar prior trial using a Learning Collaborative.(25) Second, we included 5 sites in the intervention group, and 6 in the control group. We assumed that average number of providers in each practice is 5, and that there would be substantial intra-cluster correlation (ICC) among patients within a given provider. We conservatively assumed a range of ICC is 0.1–0.3 based on prior work.(26) Third, the significant level (alpha) was two-sided 0.05, and the goal power was 80%.

Based on these assumptions, we estimated sample sizes for the proposed trial (see Table 2). The required number of patients per provider needed to detected meaningful differences was

calculated for each set of assumptions.(27) In the bolded cells in Table 2, we show the sample size estimates per provider for the most relevant assumptions. Based on these estimates, we reviewed at least 6 random patients per provider with eligible visits to ensure an adequate sample size to achieve 80% power.

RESULTS

The 11 rheumatology sites in the TRACTION trial are listed in Table 3 with a description of their baseline characteristics. The sites are located across the US, and half have rheumatology fellowship trainees. Other relevant characteristics of the sites include: 4 (36%) of the 11 have nurse practitioners or physician assistants; all sites see a broad mix of Medicare, Medicaid and commercially insured patients.

While we have not yet conducted the trial outcomes assessments using formal medical record review, we have asked the Phase 1 Learning Collaborative intervention sites to collect monthly improvement metrics on their own charts. These monthly reviews through the first 6 months suggest improvement on most aspects of the Change Package (see Figure 3). Several are in the 70–80% range. The one measure that remains low is the percentage documenting why therapies are not intensified even though the disease activity measurement demonstrates that the patient is not at target.

In the trial, implementation of TTT will be measured using a medical record review tool developed for this project, not self-assessment (see Supplemental Table and Results for reliability). The four item tool has excellent inter-rater ($\kappa = 94\%$, 95% confidence interval 90–99%) and intra-rater reliability ($\kappa = 98\%$, 95% confidence interval 95–99%).

DISCUSSION

Optimal management of RA requires ongoing monitoring of disease activity and adjustment of treatment to achieve and maintain a state of low disease activity or remission. Patients live with the daily symptoms and medications must be frequently adjusted to maintain disease control. This requires a provider-patient shared decision making process, setting treatment targets and then working to find effective treatments. This differs somewhat from hypertension or diabetes where a simple test can determine whether objective treatment targets are met. The TTT strategy within RA serves to incorporate the patient perspective while recognizing the long-term goals of maintaining function and minimizing pain.(1) Despite the attractiveness of this strategy, it has been difficult to implement in routine practice.(16) Treat to Target requires process improvement – determining an appropriate treatment target with patient involvement, measuring disease activity regularly, modifying treatments in accord with the treatment target – that is facilitated by a team approach to care. We developed the TRACTION trial to test whether a Learning Collaborative intervention would be an effective means to enhance implementation of TTT.

Based on the intervention sites' self-assessments (see Table 3), it appears that there has been improvement, but the trial outcome was determined by structured chart reviews conducted by the study team on randomly selected charts. The primary outcome was implementation of

TTT, as determined by the four measures. Disease activity was assessed in a subset of sites but will likely be underpowered; prior trials have already shown that TTT results in improved disease activity, so we can infer that successful implementation of TTT will result in decreased disease activity.(28)

The Learning Collaborative is aimed at improving implementation of TTT and not on specific aspects of patient care. Thus, the PDSA cycles are aimed to improve implementation of TTT. The cycles that we have observed are not about specific individual patient care issues. Instead, they involve how to implement as a care team the four aspects of interest for TTT: consistent measurement of a disease activity measure; selection of a treatment target; demonstration of shared-decision making in circumstances where decisions are being made; and documentation how targets guide treatment unless there is an exception. Sites can adopt specific tools to enhance patient management depending on their goals.

Several strengths of the Learning Collaborative are noteworthy. First, the Learning Collaborative allows for collaboration across practice sites. This type of collaboration is exciting for the sites and appears to empower them; high performing sites become teachers resulting in a virtuous cycle of reinforcement. Second, the Learning Collaborative promotes process improvement whereby practices fundamentally change how they deliver care, facilitating sustained improvement. In the TRACTION Learning Collaborative, this has translated into the office staff handing out disease activity assessments, providers changing the discussions they have with patients, providers using formal disease activity assessments to make treatment decisions, and changes in how care is documented. In other Learning Collaboratives, these process improvements have resulted in long-term changes that are enduring.(18) Third, the Learning Collaborative model can be applied to improve other processes of care. For example, in rheumatology, a Learning Collaborative could be designed to improve care of the post-osteoporosis fracture patient, where processes need to be developed to identify patients, ensure appropriate testing and treatment for osteoporosis, and provide education around medication adherence and fall reduction.

There are important limitations of the Learning Collaborative as well. First, it is an intensive process that requires many hours of team meetings and process improvement for the participating sites. Only selected sites will participate, limiting its generalizability. It is important to demonstrate that if it works, it can be made simpler and easier, allowing for uptake by many sites. For example, eliminating all face-to-face meetings or substituting faculty site visits to augment the webinars may reduce barriers for many providers to participate. In addition, other incentives could be offered to sites: successful completion of a Learning Collaborative could be noted in ratings of clinical sites. Second, the TRACTION trial outcomes will be measured using medical record review and not actual recorded behavior. Sites may appear to improve their adherence with TTT by changing their documentation and not actually changing their behavior. We have decided to not pursue using simulated patients or audio-recordings of visits, so this limitation is difficult to avoid. Third, we will not have information on health care and pharmacy insurance which could affect implementation of TTT. Fourth, it is possible that sites in the control arm could have begun some improvement activities during Phase I. Finally, we recognize that our assessment of shared decision-making is limited. Shared decision-making requires patient

and provider participating in the decision-making, where information is shared, a treatment decision is made and both parties (patient and provider) agree on the decision.(29) We are not assessing all of these aspects in our trial. Nevertheless, chart reviews allow evaluation of the proportion of patients achieving the pre-determined target and why treatment was not modified if target disease activity was not attained.

In conclusion, we designed the TRACTION trial to test whether an Learning Collaborative intervention improves implementation of TTT in rheumatology practices. Early self-assessment by sites is encouraging, but the trial results await medical record review after Phase 1.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Significance and Innovations

- Traditional quality improvement using passive education has been found to be marginally effective.
- Learning Collaboratives in many areas of health care demonstrate substantial process improvement and outcomes.
- The TRACTION Trial demonstrates innovative design and will test a Learning Collaborative to implement treat to target for rheumatoid arthritis.

Figure 1.

This figure illustrates the design of TRACTION. Phase 1 is the randomized control clinical trial comparing the Learning Collaborative intervention with a wait-list control group. Phase 2 provides the Learning Collaborative intervention to the Phase 1 control group while the Phase 1 intervention group is observed.

Figure 2.

This diagram displays the TRACTION Learning Collaborative Change Package. The Change Package has three overarching principles followed by more detailed change concepts. RA= rheumatoid arthritis; DAM= disease activity measure.

Figure 3.

This graph shows collaborative-wide improvement measures, which are collected by providers at each site on a monthly basis through medical record review. Providers were asked to randomly sample visit notes. The measures reflect the principles endorsed in this Learning Collaborative. Trial outcomes will be assessed by study staff in a separate review of visit notes.

Table 1

Schedule of Learning Collaborative Activities

Month	Activity	Focus/Content
-1	Pre-work	Baseline self-assessment measures
0	LS 1 *	Change Package, treat-to-target principles, process improvement methods, PDSAs, disease activity measures, team building
1	LS 2	Updates on sites' PDSAs, monthly self-assessment measures
2	LS 3	Updates on sites' PDSAs, monthly self-assessment measures, disease activity measures
3	LS 4	Updates on sites' PDSAs, monthly self-assessment measures, documentation
3-4	Coaching Call 1	Individualized team call to summarize progress, discuss challenges, and provide guidance for future PDSA cycles through written feedback
4	LS 5	Updates on sites' PDSAs, monthly self-assessment measures, shared decision-making
5	LS 6	Updates on sites' PDSAs, monthly self-assessment measures, quality improvement projects
6	LS 7	Updates on sites' PDSAs, monthly self-assessment measures, sustainability and team dynamics
7	LS 8	Updates on sites' PDSAs, monthly self-assessment measures, treat-to-target
7-8	Coaching Call 2	Individualized team call to summarize progress, discuss challenges, and provide guidance for spread and sustainability through written feedback
8	LS 9	Updates on sites' PDSAs, monthly self-assessment measures, spread and sustainability

LS= Learning Session; PDSA= Plan-Do-Study-Act method for process improvement

* All Learning Sessions were conducted via webinar except LS 1, which was a full-day face-to-face meeting.

Table 2

The Estimated Number of Patients per Provider to Produce 80% Statistical Power, Assuming an Average of Five Providers Per Site

Intra-cluster correlation [†]	Intervention Arm % Improvement	Control Arm % Improvement		
		0%	5%	10%
0.1	20%	2	4	26
	30%	2	2	3
	40%	2	2	2
0.2	20%	2	6	∞
	30%	2	2	4
	40%	2	2	2
0.3	20%	2	12	∞
	30%	2	2	5
	40%	2	2	5

[†]Intra-cluster correlation measured at the provider level.

NA: The sample size cannot be estimated with small group difference and large ICC.

The **bolded cells** represent the most likely scenario and will be used to estimate sample size.

Table 3**Baseline Characteristics of the Eleven Rheumatology Practices in TRACTION**

Phase	Site	Providers	Trainees	Mid-Levels	Total Patients Seen in 2014	Medicare	Patient Insurance (%)		
							Medicaid	Commercial	None
1	Loyola University Medical Center	3	No	No	1800–2000	31	16	49	4
	UT Houston Rheumatology Clinic	5	Yes	No	1000	20	20	55	5
	NorthShore University HealthSystem	10	No	No	920	35	5	59	1
	UK Division of Rheumatology	9	Yes	Yes	1850	23	33	38	3
2	UVM Medical Center Rheumatology	5	Yes	Yes	NA	NA	NA	NA	NA
	Park Nicollet Rheumatology	6	No	No	2300	13	12	72	3
	Private Practice in California	2	No	Yes	350	60	1	35	4
	University of Kansas Medical Center	10	Yes	Yes	500	40	10	45	5
	UTMB Rheumatology	6	Yes	No	4000	40	15	40	5
	UVA Rheumatology	5	No	Yes	550	25	10	50	5
	Vanderbilt University Medical Center	2	No	No	250	25	5	60	10

* Characteristics are self-reported by sites.

NA, not available from this site.