Redesigning the care of rheumatic diseases at the practice and system levels
Part 1: Practice level process improvement (Redesign 101)

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ABSTRACT

Redesigning the delivery-of-care processes for rheumatic diseases within rheumatology practices and health systems is critical to improving the outcomes and costs of care for the patients we serve. This work is best accomplished using Continuous Quality Improvement Methods, also known as Plan-Do-Study-Act (PDSA) cycles that are widely utilized in many other industries, but not often in health care or among physicians. This first of two companion articles provides background on health care redesign, understanding of PDSA methods, and examples of successful rheumatology practice process redesigns based on PDSA. It is offered as a starting point for rheumatologists preparing for this necessary work.

Introduction

The priority of improving patient outcomes and the costs of chronic disease care in the United States has been clearly articulated by the Institute of Medicine (IOM) and others (1). Chronic diseases including those that rheumatologists treat are consuming 70% of the U.S. health care budget – $1.5 trillion per year. One-third of this care is unnecessary, and at the same time much important care is not being provided dependably or at all. Government, businesses that purchase health care, private insurers and patients expect better performance from the U.S. health system and its providers. The realities of rising costs and waste have prompted reimbursement strategies that interfere with important care and harass providers (2, 3). Rheumatologists must address these problems, not only because it is the right thing to do for our patients, but also because we are increasingly being held accountable for our performance.

It is one thing to acknowledge the need to improve our practices and health systems, and another to do it. The IOM has concluded that nothing short of a fundamental redesign of health care delivery will provide effective health care to our society, and has identified the requirements for accomplishing this goal (Table I). Many rheumatologists, like most other physicians, still do not understand that continuing our same approaches to patient care will never provide different results, no matter how hard we try (4). Few of us have been trained in the methods needed to reinvent our practices. While some rheumatologists and health systems have begun practice redesign and have proven that optimal outcomes at a lower cost are possible, a broader commitment to positive change is needed, as was recently mandated for internal medicine training programs by the Accreditation Council for Graduate Medical Education (5).

This and the following paper will describe the process redesign methods best suited for improving clinical results and efficiency, commonly referred to as rapid cycle process improvement, clinical process improvement, or Plan-Do-Study-Act (PDSA) methods. Rapid cycle process improvement relies on multiple small tests of change (PDSA pilot cycles) to achieve improvement without disrupting function in complex systems. These have been used successfully in many other industries, and are being applied increasingly in healthcare as well. We hope that rheumatologists will recognize the need to change, learn practice improvement methods, and incorporate them into our training programs and practice management. Sharing successful redesigns broadly across our specialty will also be critical to our future success, so that each practice does not need to rework the same problems.

Table I. Institute of Medicine requirements for improvement (1).

- Redesigning Care Processes
- Making Effective Use of Information Technologies
- Managing Clinical Knowledge and Skills
- Developing Effective Teams
- Coordinating Care across Patient Conditions, Services, and Settings over Time
- Incorporating Performance and Outcome Measurements for Improvement and Accountability

The first paper will focus on basic PDSA methods and provide practice-level examples. The second will discuss the more complicated challenges of system-level redesign and provide examples of rheumatic disease care improvement at this broader level. We will draw upon our personal redesign experiences and the practice redesign workshop that we have been teaching for the last six years at the American College of Rheumatology meetings.

Four caveats must be addressed at the outset. First, we are convinced that clinical process improvement is a fundamentally different methodology from research. Redesigning delivery of care will be best accomplished by the former approach, as opposed to discovering new knowledge and treatments, for which research is ideally suited. Dr. David Lawrence has clearly articulated this perspective: "Our goal must be to identify the combination of essential delivery system 'production' factors that can consistently deliver care of greatest value for patients over the lifetime of their illnesses." The academic mindset is to research the problem; however, as Dr. Lawrence continues, "These strategies can help, but – like using a pellet gun to stop an onrushing elephant – they aren't up to the challenge" (6). An increasing commitment of academic manpower and grant funds for Type 2 Translational Research to rigorously examine single practice variables in controlled studies is generally providing clinically insignificant results, as was predicted by experienced health care redesign experts years ago (7). We will focus on clinical process improvement methods, to encourage their broader use in resolving delivery-of-care problems in health systems, and especially within academic medicine.

Second, process standardization at the clinical practice and health system levels is essential to improvement. High process variance always predicts low performance and high waste in any system, yet it is the rule in medical practice. It is not only tolerated, but many physicians rationalize it as a professional value, and resist the priority for building consensus around best practice. Rheumatology practices often have idiosyncratic scheduling templates and different record keeping formats for each provider. Treatments for the same problem differ from patient to patient and from physician to physician without relation to disease status, scientific evidence, or patient preference. The safety record of surgical anesthesia provides an exception to the chaos that pervades U.S. health care (8). Standardization is inherent in all clinical process improvement, and we must embrace it if we are to optimize outcomes and reduce costs. Developing clear processes and rules rationalizes the flexibility required to recognize and effectively address both the 'frequent typical' and the 'infrequent exceptional' clinical circumstances.

Third, practice improvements must not only impact outcomes and costs favorably, but must save providers time and improve the practice bottom line for us to invest the effort required to accomplish them. Pay-for-performance is turning the tables by requiring improvement as a condition for maintaining reimbursement. Improved efficiency rather than increased service volume will be required to maintain profitability in this new context. Ideally, payers who stand to benefit from our efforts should also reward them, but we may have to prove our worth before receiving any return (8).

Fourth, the physician office visit is the cornerstone of traditional outpatient health care, and this approach has been institutionalized by fee-for-service reimbursement. Reflexive scheduling of follow-up visits not only for solving active problems, but for routine disease reassessment, drug safety monitoring, and prescription refills is widespread. Much of this work does not actually require a physician visit, yet a full follow-up schedule is a measure of security, and a revenue guarantee. At the same time this approach reduces access for necessary care, raises costs unnecessarily, reduces profits in capitated reimbursement environments, and creates a phantom demand for more rheumatologists. Testing and implementing more efficient ways to provide the components of care through PDSA methods will be critical to addressing the impending shortage of rheumatology manpower (9) and the escalating cost of health care (1). Level 1 provider-supervised nurse visits and structured nurse telephone follow-up of treatment adherence are two compelling alternatives to office visits (10), as are internet-based approaches for receptive patients (11). Our efforts in this regard are ongoing, as subsequent examples will illustrate.

The remainder of this article (Part 1) will be dedicated to the basic steps for problem solving and process redesign, PDSA rapid cycle improvement methodology, rheumatology practice-based redesign examples, and conclusions about redesign at a practice level.

What are the basic steps for problem solving and process redesign?

Process improvement at the practice level and process improvement at the system level utilize the same basic methods. One major difference is that at a system level, the chance for significant failure from a project or program is escalated because of the complexities and size of the various systems that are affected (see Part 2 for a discussion of systems). However, as long as a "start small, assess quickly, be prepared to fail, and adjust and adapt accordingly" philosophy is maintained, significant improvement should be safely obtained in both situations.

The basic steps for problem solving and process improvement include:

– defining the problem
– analyzing the problem
– developing some potential solutions
– testing one or more of the solutions
– measuring the test results
– reassessing/retesting/remeasuring

How do I define the problem?
Most people believe they can easily define the problem at hand. Not so! When defining a problem, three criteria must be met. The problem must be something over which you have control, you cannot assume that you know the reason for the problem, and you cannot give a solution to the problem. To illustrate, let us use "access to rheumatologic care" as the problem. A bad way to frame this problem would be: "If only I had enough rheumatologists, our backlog would be fine." While you may have control over hiring additional staff, this statement both assumes that the **reason** for your backlog is inadequate staff (assumed causality) and that the **solution** is just to hire more rheumatologists. A much better way to define this problem is the statement: "We cannot see rheumatology patients in a timely fashion." By defining the problem in this manner, there is no flawed premise as to why the problem might exist and no pre-set solution, opening up a much more robust list of possible solutions.

Why am I having the problem?
The next step is to analyze why the problem may be occurring. One method to consider is the "fishbone diagram," also known as the Ishikawa Diagram (after Kaoru Ishikawa, an innovator in industrial quality management) (12). The fishbone is a tool for examining cause and effect. Causes can be elicited through brainstorming sessions (see "solutions" step for more on brainstorming). The potential causes can be placed in categories such as people, equipment, materials, and process. In Figure 1, a sample fishbone diagram outlines the potential reasons (cause) for the problem of lengthy appointments (effect).

How do I develop some solutions?
After analyzing the problem, potential solutions must be developed. One approach is to brainstorm a longer list of solutions and then prioritize that list. Brainstorming involves getting a larger group of stakeholders together (*e.g.*, rheumatologists, nurses, secretaries, other ancillary staff as indicated) and assigning someone as the scribe who visually records the solutions on an easel for everyone to see. The rules of brainstorming engagement include: no criticisms, encourage exaggerated ideas, get lots of solutions, and allow everyone present to participate. A smaller group then sorts through the lists and selects a few solutions to test.

How do I test a solution using the PDSA methodology?
The process of testing one or more of the solutions, measuring the results of that test, and reassessing/retesting/remeasuring involves the fundamental driving force of rapid cycle process improvement – the PDSA cycle (13, 14). A PDSA (Plan, Do, Study, Act) cycle involves a small-scale test of change. It is the method by which process improvement can be measured, and is a simple yet powerful tool. The PDSA elements are as follows:

- Plan – state the objective, predict what will happen, develop a plan.
- Do – do it, record observations, begin data analysis.
- Study – complete the analysis, compare to predictions, summarize.
- Act – modify and plan next cycle.

To show that the concept of PDSA thinking is not foreign to the practicing rheumatologist, consider the case of a 57-year-old woman suspected clinically of having polymyalgia rheumatica. Rheumatologist #1 treats the patient with prednisone. Rheumatologist #2 enters the patient in a randomized controlled trial of NSAIDs versus prednisone. Rheumatologist #3 places the patient on prednisone, asks her to record her response, and schedules a follow-up visit in 2 weeks for reassessment. Rheumatologist #3 performed all the elements of a PDSA cycle.

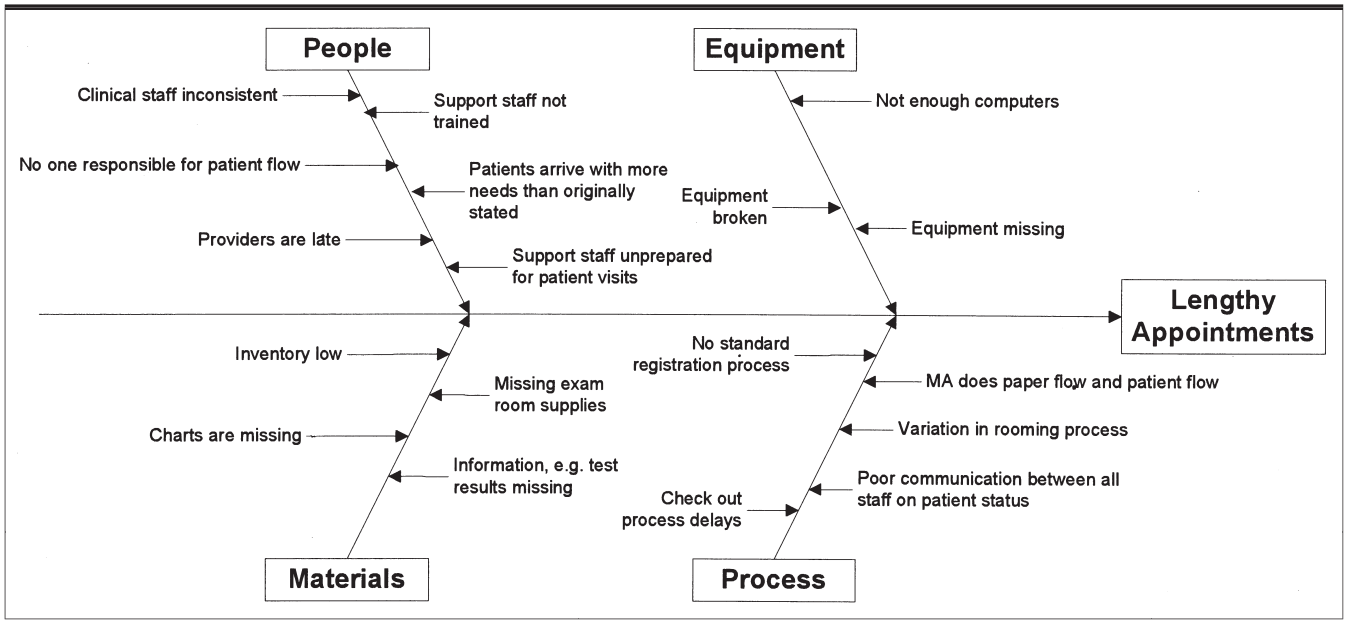


Fig. 1. Fishbone (cause and effect) of lengthy appointments.

Once the first PDSA cycle is completed, another cycle is performed, and then another, and another, until the problem is improved. This is why the methodology is called continuous process improvement, and why it has become engrained in the cultures of exceptional enterprises. It is very common for a PDSA cycle to result in a failure (defined as not solving the problem). However, incredible insights into the problem can be had by PDSA failures, and they provide the substrate on which to base the next cycle. By keeping the PDSA limited to a small scope and rapid assessment, any failure is very unlikely to have catastrophic consequences.

What are some examples of a practice-based approach to rheumatologic care?

Example 1: Redesigning clinical data collection during the rheumatology office visit (University of Wisconsin) (15)

Defining and analyzing the problem: Chronic disease management begins with having the necessary clinical information collected and organized in a way that promotes optimal therapeutic decision-making and the monitoring of disease status and treatment safety. This activity accounts for a high percentage of a rheumatologist's work, most of it taking place during outpatient visits by established patients for rheumatoid arthritis (RA) and other chronic rheumatic diseases. Our traditional approaches to doing this work are generally inefficient, highly variable, and undependable. The complexity of the task is steadily increasing because of growing treatment options and expanding requirements for documenting services and disease outcomes. The electronic medical record actually does little to improve efficiency and physician functioning in and of itself; it merely stores whatever information we enter, in whatever format we enter it. A more fundamental redesigning of how we collect and manage information is needed, and the potential impacts of these efforts on outcomes and costs should be dramatic. Continuing with our traditional approaches will lead to a further deterioration in outcomes, costs, and profits.

Planning possible process changes: The strategies we identified included:

- to standardize data collection during the patient visit,
- to complete all possible aspects of data collection and organization before the physician-patient encounter,
- to provide real-time quantitative disease activity scoring, and
- to create a standardized physician dictation template based on this clinical data set.

By making these changes we expected the rheumatologist-patient encounter to become more focused on analyzing and solving problems instead of collecting and organizing information.

PDSA cycle 1 – Creating a standardized visit database and dictation template for established RA patients: As a first step, it was necessary to agree on what information was needed to assess a patient's disease status and treatment safety risks, and to guide patient management. We first considered creating such a data set ourselves, but then recognized that the Consortium of Research Rheumatologists of North America (CORRONA) data set not only includes all of the most important clinical information, but also provides a highly efficient approach to capturing and recording it (see Fig. 2). Patients self-report much of their history on the patient data form in the waiting room before entering the exam room. Further data collection by the physician in the examination room is also structured in CORRONA in a series of 8 key questions on a second form, and the results of the joint exam are recorded on a homunculus. Clinical and laboratory drug monitoring results are also reported. A standardized dictation template has been developed that confirms the data collected on the CORRONA forms, reports key findings, and lists other information necessary to the interpretation of the data and plans for treatment.

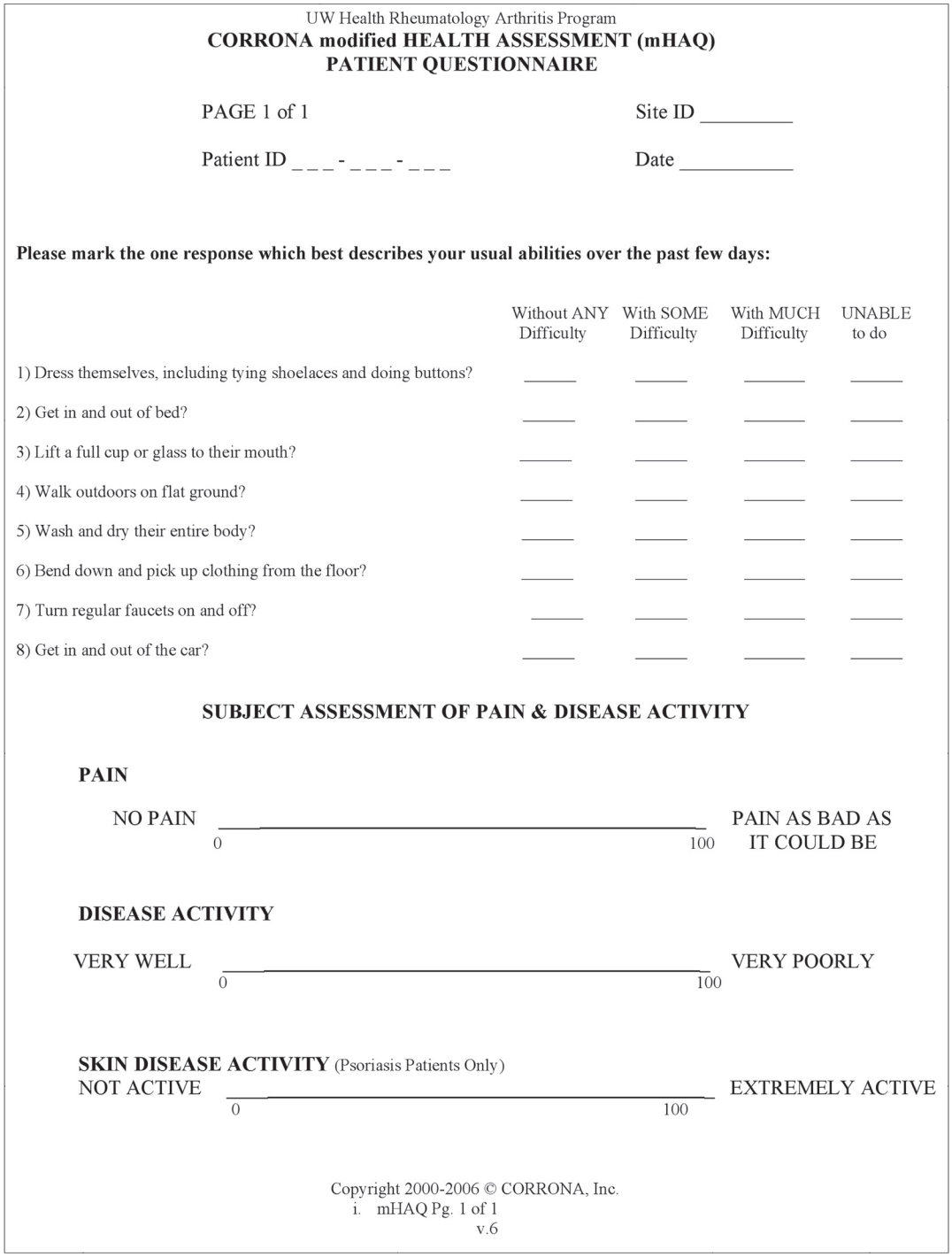
These forms were pilot tested during visits with consenting patients, to investigate how they would impact the visit process and to determine their practicality. First we tested the patient waiting room forms, then the physician encounter forms. The dictation template was tested off line using previously completed CORRONA research visit forms. The results indicated that patients performed well and accepted the change willingly; that the nature of the physician encounter was more structured, efficient, and focused on the patient's important problems; and that both encounter and dictation times were reduced.

PDSA cycle 2 – Disease activity scoring: Options for real-time disease activity scoring during the patient visit were either to continue using a quantitative score from the health assessment questionnaire (modified-HAQ) developed by Dr. Ted Pincus and others (16) or to calculate a Global Arthritis Score (GAS) from the patient's visual analogue score (VAS) for pain, the mini-HAQ, and the tender joint count, as developed by Dr. Jack Cush (17). All the information necessary for the GAS calculation is contained in the patient CORRONA forms, including the tender joint homunculus. In the latter case, our nurses would not only continue to record vital signs and review medication lists during the patient's check-in, but also calculate and record the GAS. The GAS option was pilot tested and adopted.

PDSA Cycle 3 – CPT visit coding level: Our coding department reviewed the completed visit data set to determine what level of service it would support. They verified a Level 4 visit at a minimum, particularly because the patient data form includes a complete review-of-systems checklist. A Level 5 code would require a 9-system physical examination and/or at least 4 actively managed problems in the impression and plans. Based on this advice we added a physical exam checklist to the physician encounter forms.

PDSA Cycle 4 – Full implementation: The entire visit process was outlined on a flow chart indicating who (staff, patients, nurses, or physicians) would carry out each step and when (pre-visit, in the waiting room, in the exam room, or post-visit). Patients were informed about the process change and were assisted the first time they were given the forms. Their attitudes and concerns

A



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CORRONA modified HEALTH ASSESSMENT (mHAQ)
PATIENT QUESTIONNAIRE

PAGE 1 of 1 Site ID _____

Patient ID _ _ _ - _ _ _ - _ _ _ Date _____

Please mark the one response which best describes your usual abilities over the past few days:

	Without ANY Difficulty	With SOME Difficulty	With MUCH Difficulty	UNABLE to do
1) Dress themselves, including tying shoelaces and doing buttons?	_____	_____	_____	_____
2) Get in and out of bed?	_____	_____	_____	_____
3) Lift a full cup or glass to their mouth?	_____	_____	_____	_____
4) Walk outdoors on flat ground?	_____	_____	_____	_____
5) Wash and dry their entire body?	_____	_____	_____	_____
6) Bend down and pick up clothing from the floor?	_____	_____	_____	_____
7) Turn regular faucets on and off?	_____	_____	_____	_____
8) Get in and out of the car?	_____	_____	_____	_____

SUBJECT ASSESSMENT OF PAIN & DISEASE ACTIVITY

PAIN

NO PAIN _____ PAIN AS BAD AS IT COULD BE
0 100

DISEASE ACTIVITY

VERY WELL _____ VERY POORLY
0 100

SKIN DISEASE ACTIVITY (Psoriasis Patients Only)
NOT ACTIVE _____ EXTREMELY ACTIVE
0 100

i. mHAQ Pg. 1 of 1
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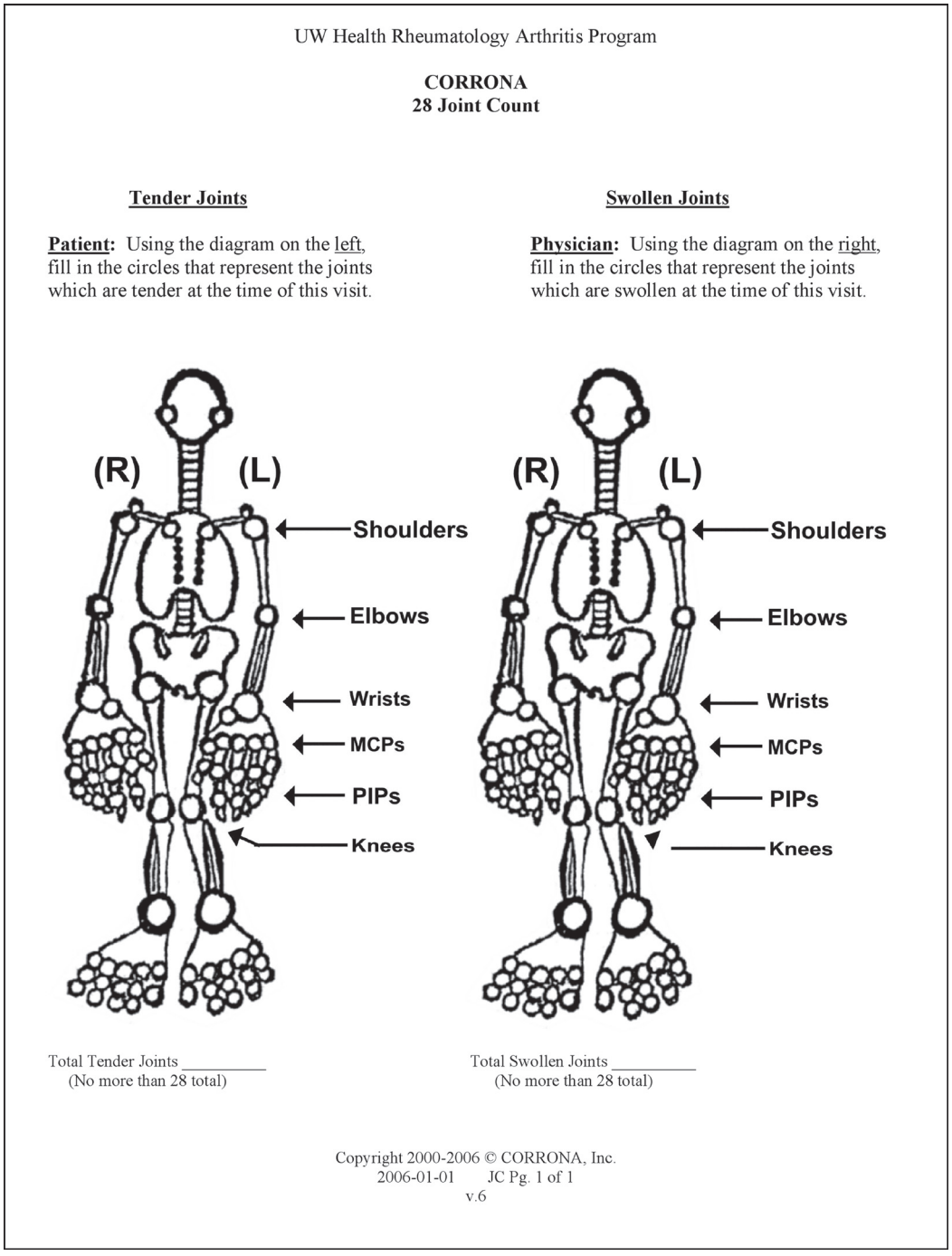
Fig. 2. Pages 3 and 4 (**A** and **B**) of the CORRONA Patient Established Visit Form include the information needed to calculate a Global Arthritis Score. Page 1 (**C**) of the CORRONA Physician Form includes standardized screening questions.

were recorded and reviewed. An RA patient registry was established to identify all RA patients for chart preparation. Once the process was in place, patients were invited to participate in the CORRONA research project through a letter sent in advance of their visit. Up to this point, over 90% of our RA patients have completed at least one standardized visit and 40% have been enrolled in the CORRONA research project.

Ongoing monitoring of improvement and study in PDSA: This phase requires the continual review of results to define both the benefits accrued and any negative consequences that may require further attention. Important findings have included:

1. The rheumatologist is provided with a more complete and predictable data set with a 40% savings in face-to-face time, which gives him more time to perform a careful joint exam and address the patient's most important concerns. This is accomplished by shifting some of the work that used to occupy the physician

B



UW Health Rheumatology Arthritis Program

CORRONA
28 Joint Count

Tender Joints

Patient: Using the diagram on the left, fill in the circles that represent the joints which are tender at the time of this visit.

Swollen Joints

Physician: Using the diagram on the right, fill in the circles that represent the joints which are swollen at the time of this visit.

Total Tender Joints _____
(No more than 28 total)

Total Swollen Joints _____
(No more than 28 total)

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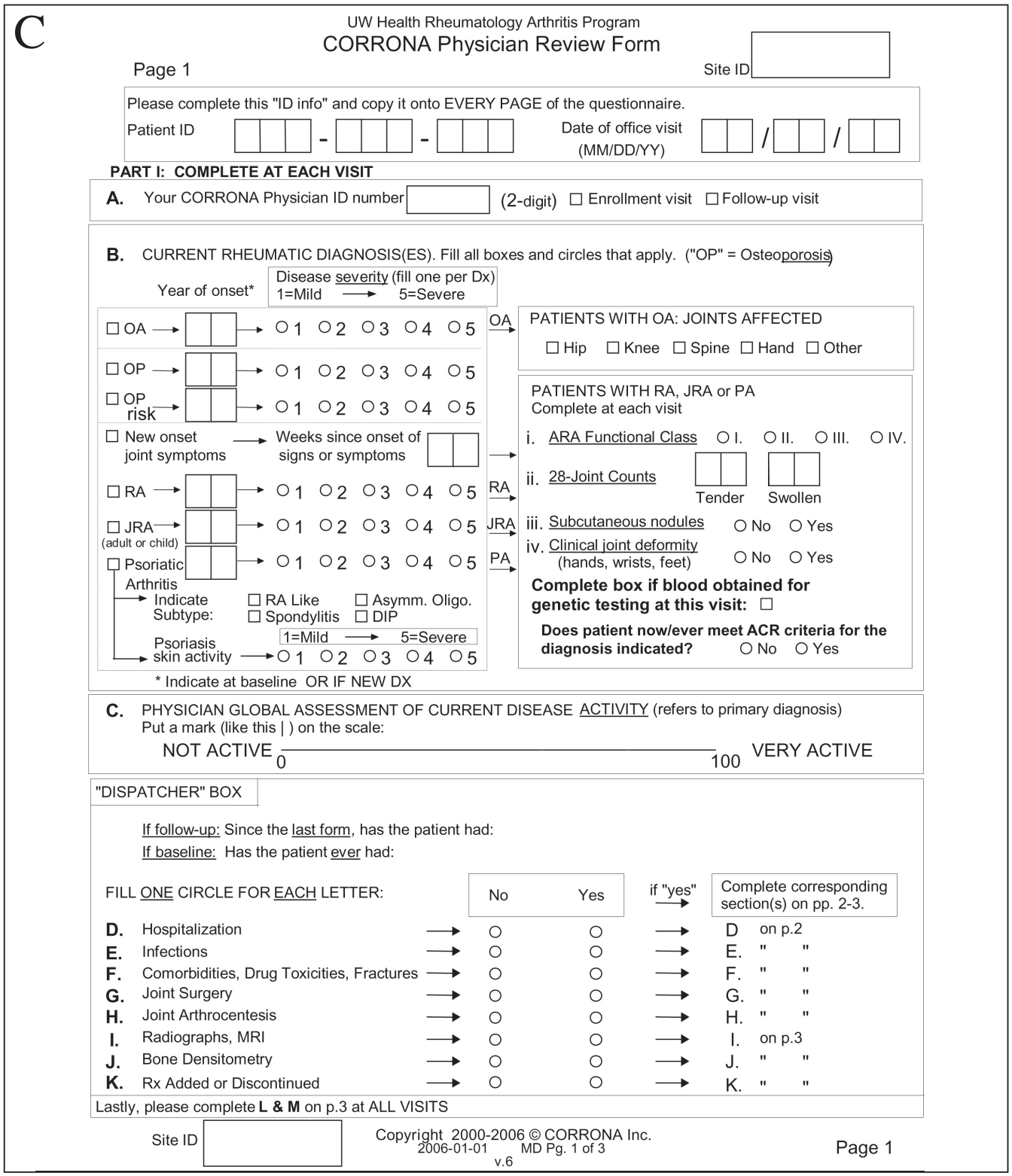
Fig. 2. Pages 3 and 4 (**A** and **B**) of the CORRONA Patient Established Visit Form include the information needed to calculate a Global Arthritis Score. Page 1 (**C**) of the CORRONA Physician Form includes standardized screening questions.

to the patient and the nurse and by the inherent efficiency of process standardization. The standardized template also saves about 40% in physician dictation time.

2. All but a few patients quickly recognize the advantages of these changes, including participation in the CORRONA research project. They feel able to report their concerns more completely and that they have more effective time with the physician.
3. Quantitative real-time disease activity scoring does support improved therapeutic decision-making. Furthermore, the separation of the patient-generated GAS components from the rheumatologist's global assessment of RA disease activity helps to distinguish active RA from other co-morbidities that may also contribute to pain, functional loss, and joint tenderness, such as accumulated joint damage, osteoarthritis, fibromyalgia, and non-rheumatic diseases. This insight suggests an additional reason for using patient-generated scoring systems in clinical practice instead of the more complex and inclusive scoring sys-


C

UW Health Rheumatology Arthritis Program

CORRONA Physician Review Form

Page 1

Site ID

Please complete this "ID info" and copy it onto EVERY PAGE of the questionnaire.

Patient ID ___ - ___ - ___ Date of office visit (MM/DD/YY) __ / __ / __

PART I: COMPLETE AT EACH VISIT

A. Your CORRONA Physician ID number ____ (2-digit) ☐ Enrollment visit ☐ Follow-up visit

B. CURRENT RHEUMATIC DIAGNOSIS(ES). Fill all boxes and circles that apply. ("OP" = Osteoporosis)

Year of onset* | Disease severity (fill one per Dx) 1=Mild → 5=Severe

☐ OA → ___ → ○1 ○2 ○3 ○4 ○5 OA

☐ OP → ___ → ○1 ○2 ○3 ○4 ○5

☐ OP risk → ___ → ○1 ○2 ○3 ○4 ○5

☐ New onset joint symptoms → Weeks since onset of signs or symptoms ___

☐ RA → ___ → ○1 ○2 ○3 ○4 ○5 RA

☐ JRA (adult or child) → ___ → ○1 ○2 ○3 ○4 ○5 JRA

☐ Psoriatic Arthritis → ___ → ○1 ○2 ○3 ○4 ○5 PA

→ Indicate Subtype: ☐ RA Like ☐ Asymm. Oligo. ☐ Spondylitis ☐ DIP

→ Psoriasis skin activity → 1=Mild → 5=Severe ○1 ○2 ○3 ○4 ○5

PATIENTS WITH OA: JOINTS AFFECTED

☐ Hip ☐ Knee ☐ Spine ☐ Hand ☐ Other

PATIENTS WITH RA, JRA or PA

Complete at each visit

i. ARA Functional Class ○ I. ○ II. ○ III. ○ IV.

ii. 28-Joint Counts ___ Tender ___ Swollen

iii. Subcutaneous nodules ○ No ○ Yes

iv. Clinical joint deformity (hands, wrists, feet) ○ No ○ Yes

Complete box if blood obtained for genetic testing at this visit: ☐

Does patient now/ever meet ACR criteria for the diagnosis indicated? ○ No ○ Yes

* Indicate at baseline OR IF NEW DX

C. PHYSICIAN GLOBAL ASSESSMENT OF CURRENT DISEASE ACTIVITY (refers to primary diagnosis)

Put a mark (like this |) on the scale:

NOT ACTIVE 0 ——— 100 VERY ACTIVE

"DISPATCHER" BOX

If follow-up: Since the last form, has the patient had:

If baseline: Has the patient ever had:

FILL ONE CIRCLE FOR EACH LETTER:	No	Yes	if "yes" →	Complete corresponding section(s) on pp. 2-3.
D. Hospitalization	○	○	→	D on p.2
E. Infections	○	○	→	E. " "
F. Comorbidities, Drug Toxicities, Fractures	○	○	→	F. " "
G. Joint Surgery	○	○	→	G. " "
H. Joint Arthrocentesis	○	○	→	H. " "
I. Radiographs, MRI	○	○	→	I. on p.3
J. Bone Densitometry	○	○	→	J. " "
K. Rx Added or Discontinued	○	○	→	K. " "

Lastly, please complete **L & M** on p.3 at ALL VISITS

Site ID

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Page 1

Fig. 2. Pages 3 and 4 (**A** and **B**) of the CORRONA Patient Established Visit Form include the information needed to calculate a Global Arthritis Score. Page 1 (**C**) of the CORRONA Physician Form includes standardized screening questions.

tems used in clinical studies, such as the DAS28. Plotting disease activity and physician global scores from our RA patients might allow us to separate those who require additional management and therapeutic acceleration from those needing other interventions, and those who could be managed by a mid-level provider or nurse monitoring visits.

Participation in the CORRONA research study generates a new revenue stream with minimal additional staff work required to upload the visit data set.

The CORRONA data forms also gather data relevant to psoriatic arthritis, osteoarthritis, osteoporosis, and ankylosing spondylitis, thus offering the prospect of standardizing data collection for still more of our established patients.

Example 2: Patient-Centric Care using Advanced Access (Geisinger) (18)

Advanced Access is defined as matching provider capacity with the demand for services in a way that provides the right patient care at the right time. We embarked on a redesign project to provide advanced access to our rheumatology practice that would meet or exceed all patients' and referring physicians' needs without triage. Several PDSA cycles were performed to address scheduling variability and inefficiencies, and to better match capacity with the demand for services. The overall process involved three phases: reducing the backlog, carving out same-day advanced access appointment slots, and retooling appointments and schedule templates. The metrics followed to track improvement included the third available appointment (an industry standard indicating when the schedule truly opens up), percent cancellations (both physician and patient), patient satisfaction (using Press-Ganey scores), and financial performance.

The first cycle involved reducing the "bad backlog" and understanding our "good backlog." "Bad backlog" refers to the group of return patients whose follow-up appointment was delayed beyond the optimal time. "Good backlog" refers to all new and return patients who need to be seen now and in the future (*i.e.*, all new consults, all return patients who need to be seen back, and all return patients who call in to be seen same day). The "bad backlog" was eliminated first by lengthening the time until the next follow-up visit whenever possible, hiring an additional part-time provider, utilizing our advanced-practice nurse more efficiently, and both simplifying and standardizing our scheduling templates. The "good backlog" was then measured to better understand the capacity within our newly designed templates compared to the existing demand for our services.

The second cycle involved blocking "carve out" slots in the morning and afternoon schedules to accommodate the anticipated volume of new consults and returns calling in to be seen on the same day, based on the capacity-demand analysis above. These slots were unavailable for use until 72 hours before their time, at which point both the schedulers and the physicians were empowered to fill them. This required a paradigm shift for the physicians – if these slots were utilized too soon ahead of time, they would not be available to meet the demand for services, thereby increasing the "bad backlog." Today's work needed to be done today, a philosophy crucial to the success of advanced access.

The third cycle involved restructuring the follow-up appointments process to reduce cancellations and re-work from an unacceptable baseline of 40%. Any patients with a follow-up request of 3 months or less would receive an appointment at clinic check-out. For follow-up appointments beyond this, the patients received a card instructing them to call in a month before their follow-up appointment due date. They were also placed on a computerized future appointment list. When they called in, they were given an appointment that met their needs. If they did not call in as scheduled, the schedulers would call them by working through the future appointment list. By not scheduling too far in advance, it was hoped that the number of cancellations and reschedules would be reduced, as would the staff time related to this work.

Outcome measures showed that the time before the third available appointment decreased from 60 days to 2 days, total cancellations (patients and physicians) fell from 40% to less than 20%, patient satisfaction scores rose significantly, and financial performance improved dramatically. Continued PDSA efforts since the initial redesign – both successes and failures – have also been helpful and enlightening. These have included providing smarter scheduling by taking into account the measured variations in demand for services and capacity during a typical year; recognizing the importance of continual process monitoring since it can be perturbed by simple changes like a new scheduler; practice team meetings on a regular basis to discuss access; building electronic scheduling tools to "make it easy to do the right thing"; closing all loops so that no patient is left without a disposition; and aligning practice goals and incentives to encourage provider buy-in.

Conclusions about practice-based redesign (Part 1)

Many aspects of our office and clinical work can become more effective and efficient through standardization and process redesign. Sharing successful improvements such as these examples will allow us to accomplish comprehensive change most effectively. Other practices that choose to implement them should use pilot testing and PDSA to do so seamlessly. The PDSA methodology and the examples outlined above represent the tactical approach to process improvement at the practice (work unit) level. Other elements crucial for success include forming a Process/Quality Improvement Team and creating a culture of change. These critical elements will be discussed in greater detail in Part 2.

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