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The Roles of Nurse Practitioners and Physician Assistants in Rheumatology Practices in the US

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Abstract

Background—A recent workforce study of rheumatology in the US suggests that during the next several decades the demand for rheumatology services will outstrip the supply of rheumatologists. Mid-level providers such as nurse practitioners (NPs) and physician assistants (PAs) may be able to alleviate projected shortages.

Methods—We administered a nation-wide survey of mid-level providers during 2012. Invitations with the survey were sent with one follow-up reminder. The survey contained questions regarding demographics, training, level of practice independence, responsibilities, drug prescribing, use of objective outcome measures, and knowledge and use of treat to target (TTT) strategies.

Results—The invitation was sent to 482 eligible mid-level providers via e-mail and 90 via US mail. We received a total of 174 (30%) responses. The mean age was 46 years and 83% were female. Nearly 75% had 10 years of experience, 53% had received formal training in rheumatology. Almost two-thirds reported having their own panel of patients. The top three practice responsibilities described were performing patient education (98%), adjusting medication dosages (97%), and conducting physical exams (96%). Over 90% felt very or somewhat comfortable diagnosing rheumatoid arthritis (RA) and a similar percentage prescribed DMARDs. Three-quarters reported using disease activity measures for RA and 56% reported that their practices used TTT strategies.

Conclusion—Most respondents reported they they had substantial patient care responsibilities, used disease activity measures for RA, and incorporated TTT in their practice. These data suggest mid-level providers may help to reduce shortages in the rheumatology workforce and conform with recommendations to employ TTT strategies in RA treatment.

INTRODUCTION

A recent workforce study of rheumatology in the US suggests that during the next several decades the demand for rheumatologists will outstrip the supply.(1) Apart from improving prevention of rheumatic diseases, potential solutions to this problem include increasing the supply of rheumatologists and/or improving efficiency within the rheumatology practice. Thus, it is incumbent upon the rheumatology profession to increase supply of rheumatologists or of providers with rheumatic disease expertise. Given the American College of Rheumatology's prediction that the number of rheumatologists practicing in the US will start to decline in 2016,(1) it becomes important to consider an increased role for mid-level providers, such as nurse practitioners (NPs) and physician assistants (PAs), in rheumatology practices.(2)

Mid-level providers have played an important role in rheumatology for over a decade.(3) As well, the use of mid-level providers has grown in many areas of medical and surgical practice and is predicted to continue to grow with reforms in health care.(4) Changes proposed in the recently enacted Affordable Care Act include a more prominent role for mid-level providers in a team-based setting, especially within Patient-Centered Medical Homes.(5) Before rheumatologists determine how best to employ mid-level providers, it would be useful to gain a greater understanding of their current roles and responsibilities. The most recent survey, conducted in 2007 among physician assistants suggested that their practice responsibilities include drug prescribing, joint injections, and research.(6)

Several studies have suggested that mid-level providers have a high level of satisfaction with the career, but little formal training. Rheumatology practice is changing rapidly with greater treatment options and a greater emphasis on aggressive treatment strategies, such as treat to target (TTT). With this emphasis on a changing practice style, requiring better access (i.e., more frequent visits in person and by telephone) and frequent treatment changes, it is unclear whether the roles of NPs and PAs have adapted.

Because of the potential growing importance of NPs and PAs, we have conducted an updated survey of these providers working in the US rheumatology field, focusing on their roles in the care of patients with rheumatoid arthritis (RA). This descriptive study was based on the hypothesis that NPs and PAs have broad responsibilities in rheumatology practice which might provide opportunities for alleviating projected workforce shortages and for facilitating use of TTT in rheumatology practice.

Methods

Study Participants

We collaborated with the Association of Rheumatology Health Professionals (ARHP) and the Society of Physician Assistants in Rheumatology (SPAR). Both organizations e-mailed a link to the survey to NPs and PAs that work in rheumatology practices in the US. The survey was also sent via US mail to some SPAR members who had no active e-mail addresses. The only requirement for survey participation was that respondents were actively

working with a rheumatologist. The survey and protocol were approved by the appropriate Institutional Review Board.

Survey

The majority of the questionnaire focused on participants' demographics, training, practice environment, level of independence, practice responsibilities, use of disease modifying anti-rheumatic drugs (DMARDs) for RA, and TTT knowledge and use. Draft versions of the questionnaire were pilot tested with three NPs and PAs. The final survey had 51 questions and the survey took approximately 10 minutes to complete (see **Appendix** for survey). Participants were mailed a \$25 gift card exchange for their completion of the survey.

The secure online questionnaire data disseminated via e-mail were collected and managed using an electronic data capture tool hosted at Brigham and Women's Hospital. Both ARHP and SPAR sent out a link to the survey accompanied by a short paragraph explaining the study and provided our contact information should participants have any questions. We administered the US mailing ourselves which included similar information accompanying a paper survey and return envelope with postage included. A single additional wave of follow up was sent to the ARHP and SPAR e-list recipients as well as the SPAR mailing list two to three weeks after the first mailing.

Statistical analysis

The primary goal of this study was to gain a better understanding of mid-levels' current roles in rheumatology and assess their capabilities in independent practice. Secondly, we were interested in their ability to implement TTT strategies. Analyses were primarily descriptive. Survey responses were stratified and compared by NP and PA certification. Means, medians and percentages were calculated and compared using appropriate statistical tests. All analyses were conducted using SAS 9.2 (Cary, NC).

RESULTS

We contacted approximately 572 NPs and PAs; precise counts are difficult because there was overlap on the lists and we did not have access to all lists to compare membership. From this pool of recipients, we received 204 questionnaires, but 30 were incomplete. The final sample was 174 unique completed questionnaires for an approximate 30% response rate.

Respondents were similar in number between NPs and PAs (see **Table 1**). PA's were slightly younger (mean 42 years) than NPs (mean 49 years, $p < 0.0001$). Ninety-four percent of NPs and 74% of PA's were female ($p < 0.001$). The duration of years in any practice was similar for NPs and PAs. There was also a fairly uniform distribution in each category, with approximately one quarter reporting 0-5 years in practice, 6-10 years, 11-15 years, and 16+ years.

Almost three-quarters of both NPs and PA's reported 10 years of rheumatology practice. Only half described having specific rheumatology training prior to joining a rheumatology practice. The vast majority described on-the-job training as well as attending the ARHP

course. Approximately, three-quarters of all respondents work full-time and two-thirds described having their own panel of patients. The average panel size of those reporting their own panels was 153 patients.

Regarding level of independence when seeing patients, few respondents described the rheumatologist assisting with all patients, about half described the rheumatologist assisting when needed, and the remaining described the rheumatologist assisting rarely or never (**Table 2**). The level of independence did not vary by age, gender or certification of the mid-level provider, nor by the number of years since certificate, the number of years in rheumatology, or rheumatology training. Respondents reporting greater confidence making the diagnosis of RA were more likely to report never seeing patients with the rheumatologist.

We examined the DMARD prescribing practices (see **Figure**). Almost all respondents reported prescribing both non-biologic DMARDs and biologic DMARDs, with a slightly higher percentage prescribing non-biologic than biologic DMARDs. They reported more frequently initiating prescriptions than modifying dosages for all medications. We did not find an association between DMARD prescribing patterns and years in rheumatology practice (data not shown).

Respondents reported a wide variety of practice activities (see **Table 3**). The most frequently reported were performing patient education, adjusting medication dosages, conducting physical examinations, general treatment, and interpreting and delivering test results. Other common roles were performing intake assessments, performing intra-articular injections, giving medication injections, and interpreting bone mineral density tests. There were some specific differences noted in the roles played by NPs and PAs, with NPs more likely to manage an infusion clinic (31% vs 15%, $p = 0.01$) and PAs more likely to interpret bone mineral density tests (75% vs 51%, $p = 0.001$). In the patient visit context, respondents frequently conducted urgent visits, as well as initial assessments and follow-up visits. There were no clear differences observed by the years in rheumatology practice (data not shown).

Finally, we examined the use of RA disease activity measures and TTT strategies. We asked respondents if they were familiar with TTT. Seventy-five percent ($n = 130$) responded affirmatively and 56% ($n = 98$) reported that their practice used TTT.

RA disease activity measure consistent use was reported by 73% of respondents (see **Table 4**). Respondents reported using the Disease Activity Score (DAS) (29%), the Clinical Disease Activity Index (CDAI) (17%), the Simple Disease Activity Index (SDAI) (8%), the Routine Assessment of Patient Index Data (RAPID) (31%), and a patient global arthritis activity index (34%). Reported use of an RA disease activity measure did not differ among those who did and those who did not use TTT ($p = 0.64$).

DISCUSSION

Several trends are likely to raise the importance of NPs and PAs in rheumatology practice. While some information exists on NPs and PAs in rheumatology, more current information may help to better understand how to optimize their roles in the future practice. We

conducted a written survey of NPs and PAs through two important practice organizations, the ARHP and SPAR. The majority of respondents described 10 years of experience in rheumatology and only half had received formal training in rheumatology. However, they reported a high level of independence and broad responsibilities in practice, including DMARD prescribing. Most reported using RA disease activity measures and approximately half reported that their practices used TTT strategies.

Respondents reported similar roles and responsibilities found in prior research.⁽⁶⁾ As well, we also found a high percentage of respondents reported prescribing DMARDs. Similar to what has been reported in the past, most respondents noted that their rheumatology training is on the job. The relationship between reported confidence in diagnosing RA and never seeing patients with the rheumatologist is unclear. On the one hand, NP and PA confidence in diagnosing RA may result in rheumatologist never seeing patients with these providers. On the other hand, it may be that rheumatologists who supervise NPs and PAs less rigorously rationalize this behavior by explaining to the NP or PA that their ability obviates seeing patients together.

These results are important on several levels. First, the substantial independence and broad responsibilities of mid-level providers suggest that they should be able to help extend the rheumatology workforce. One rheumatologist would likely be able to supervise several NPs and/or PAs multiplying the availability of rheumatic disease expertise. This change in the rheumatology workforce would require several steps: NPs and PAs would need to be recruited into rheumatology; appropriate training would need to be offered; and rheumatology practices would need to learn how to best integrate them into workflow cost-effectively. If these steps are successful, this may help to alleviate projected shortfalls in the rheumatology workforce. Integration of mid-level providers has been successfully accomplished in primary care through easing scope of practice regulations, team-based workforce training, and more formal recruitment from health professional schools.

Second, mid-level providers could facilitate efforts of rheumatologists to treat RA earlier and more aggressively using the TTT paradigm. Approximately 78% of the study sample indicated that they knew of TTT and three quarters of that subset reported using it in practice, demonstrating that a strong base already exists to expand upon. Utilizing NPs and PAs may allow for more rapid follow-up visits and improve throughput in a rheumatology practice, eliminating some of the current difficulties and constraints of disseminating TTT in typical practice.

In addition, mid-level providers are often more comfortable following a treatment algorithm and have been key in achieving TTT in other clinical areas, such as hypertension, hyperlipidemia, anticoagulation for thromboembolic event prophylaxis, and diabetes control. (7-9)

However, the lack of reported formal training may be a hindrance to recruiting NPs and PAs into rheumatology and likely slows the on the job training. Rheumatology organizations may consider working with schools of nursing and physician assistant programs to incorporate

rheumatology into the curriculum. Rheumatology preceptorships for mid-level providers would also likely be an important recruiting method.

Several limitations to our survey are important to consider. While 30-35% recruitment is typical in an e-mail survey,(10) it is not optimal. We did not have access to all of the e-mail and street addresses. Thus, we were limited in the number of attempts to recruit subjects. Also, the ARHP contacted a large portion of the potential respondents. This may have introduced some bias. Finally, as with any survey, it is unclear how well responses reflect the reality of practice.

In conclusion, we found that mid-level providers in rheumatology have many practice responsibilities and function as semi-independent clinicians with their own panels of patients. Most are comfortable with RA diagnosis and treatment and use of disease activity measures. The rheumatology profession should strongly consider methods for increasing the numbers of NPs and PAs in rheumatology practice to both enhance access and to provide a workforce that can meet evolving practice needs. This will require a strategic investment by rheumatology organizations, but will likely allow rheumatologists to provide high quality care in the evolving health care delivery system in which mid-level providers play more prominent roles.

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Significance and Innovation

- Nurse Practitioners and Physician Assistants in US Rheumatology practices report substantial patient care responsibilities, used disease activity measures for RA, and incorporated treat to target (TTT) in their practice.
- Mid-level providers may help to reduce shortages in the rheumatology workforce and to conform with recommendations to employ TTT strategies in RA treatment.

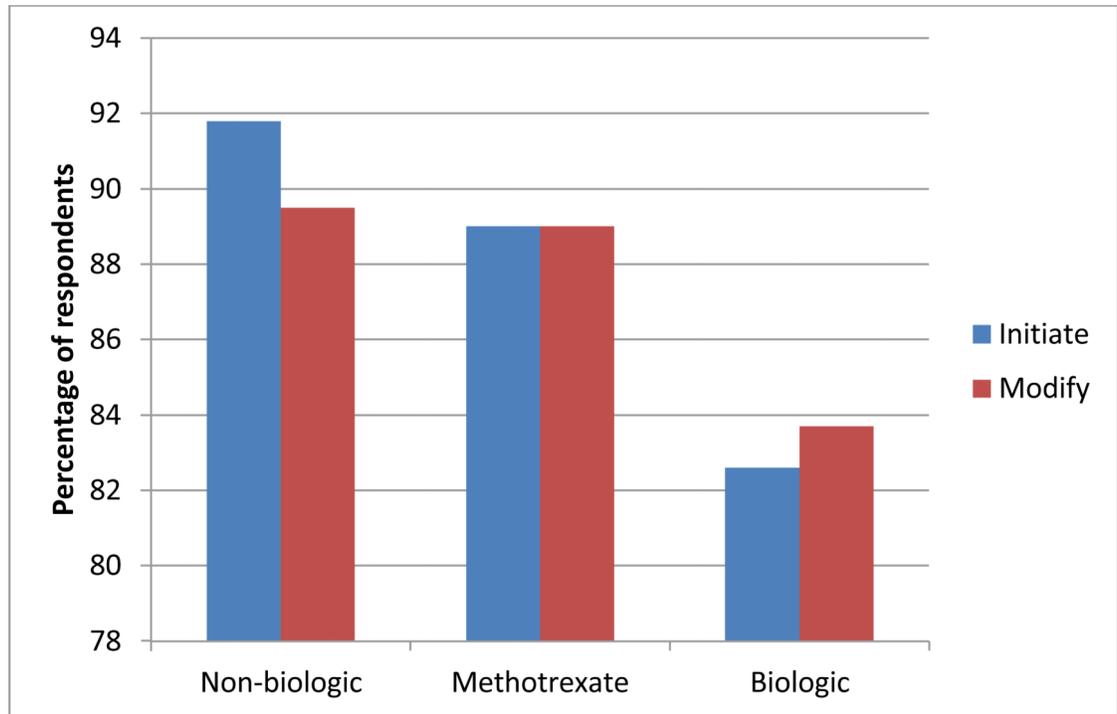


Figure.
The figure shows the percentage of respondents reporting initiation or modification of various types of DMARDs.

Table 1

Characteristics of a population comprised of rheumatology NPs and PAs

	Total	Nurse Practitioner	Physician Assistant	P-Values
<i>N (%) unless noted</i>				
N	174*	82	89	
Age, mean (\pm SD), years	46 (\pm 11.1)	49 (\pm 10.8)	42 (\pm 10.7)	<.0001
Female	144 (84.2)	77 (93.9)	66 (74.2)	<.0001
Years as NP or PA				0.19
0-5	45 (25.9)	26 (31.7)	19 (21.4)	
6-10	42 (24.1)	15 (18.3)	27 (30.3)	
11-15	39 (22.4)	25 (30.5)	13 (14.6)	
16+	48 (27.6)	16 (19.5)	30 (33.7)	
Years in rheumatology				0.55
0-5	73 (42.2)	36 (43.9)	37 (42.1)	
6-10	53 (30.6)	22 (26.8)	30 (34.1)	
11-15	32 (18.5)	15 (18.3)	16 (18.2)	
16+	15 (8.6)	9 (11.0)	5 (5.6)	
Rheumatology training	93 (53.4)	45 (54.8)	47 (52.8)	0.78
Type of rheumatology training				
ARHP courses	62 (35.6)	34 (41.5)	28 (31.5)	0.17
NP/PA program	24 (13.8)	8 (9.8)	16 (18.0)	0.12
Books and journals	64 (36.8)	31 (37.8)	32 (36.0)	0.81
ACR courses	45 (25.9)	26 (31.7)	20 (22.5)	0.17
On the job training	78 (44.8)	36 (43.9)	41 (46.1)	0.77
Local rheum review	24 (13.8)	12 (14.6)	11 (12.4)	0.66
Other	8 (4.6)	6 (7.3)	2 (2.2)	0.12
Duration of training in rheumatology				0.02
<3 months	17 (9.8)	5 (6.1)	12 (13.5)	
3 – 6 months	13 (7.5)	4 (4.9)	9 (10.1)	
6 – 12 months	28 (16.1)	15 (18.3)	12 (13.5)	
1 – 2 years	34 (19.5)	20 (24.4)	14 (15.7)	
Works full time	133 (76.4)	67 (81.7)	63 (70.8)	0.12
Own panel of patients	110 (63.2)	57 (69.5)	52 (58.4)	0.11
RA patients, mean (\pm SD)	153 (\pm 194)	147 (\pm 198)	151 (\pm 175)	0.92

Abbreviations: NP, nurse practitioner; PA, physician assistant; SD, standard deviation; RA, rheumatoid arthritis; ARHP, Association of Rheumatology Health Professionals; ACR, American College of Rheumatology

* Four participants did not identify themselves as an NP or PA; one participant identified herself as both.

Table 2

Associations between provider characteristics and level of independence

Provider characteristics	Sees all patients with rheum	Rheum assists when needed	Rheum rarely intervenes	Rheum never intervenes	P-values
<i>N (%)</i>					
Total	9 (5.4)	79 (47.6)	64 (38.6)	14 (8.4)	
Age	45 (\pm 11)	45 (\pm 11)	47 (\pm 11)	43 (\pm 8)	0.46
Sex	9 (6.6)	65 (47.4)	52 (38.0)	11 (8.0)	0.51
Female					
Male	0 (0.0)	12 (44.4)	12 (44.4)	3 (11.1)	
Certified as NP	5 (6.5)	36 (46.8)	26 (33.8)	10 (13.0)	0.19
Certified as PA	4 (4.7)	42 (48.8)	36 (41.9)	4 (4.7)	0.29
Years as NP/PA					0.05
0 - 5	3 (6.8)	24 (54.5)	10 (22.7)	7 (15.9)	
6-10	2 (5.1)	16 (41.0)	18 (46.1)	3 (7.7)	
11-15	2 (5.4)	16 (43.2)	15 (40.5)	4 (10.8)	
16+	2 (4.3)	24 (51.1)	21 (44.7)	0 (0.0)	
Years in rheumatology					0.37
0 - 5	5 (7.1)	38 (54.3)	19 (27.1)	8 (11.4)	
6-10	3 (5.9)	16 (31.4)	28 (54.9)	4 (7.8)	
11-15	0 (0.0)	14 (46.7)	14 (46.7)	2 (6.7)	
16+	1 (6.7)	11 (73.3)	3 (20.0)	0 (0.0)	
Rheumatology training	4 (4.5)	47 (52.8)	29 (32.6)	9 (10.1)	0.36
No rheumatology training	5 (6.5)	33 (42.9)	34 (44.2)	5 (6.5)	
Length of training					0.64
<3 months	0 (0.0)	7 (41.2)	8 (47.1)	2 (11.8)	
3 – 6 months	0 (0.0)	8 (66.7)	2 (16.7)	2 (16.7)	
6 – 12 months	3 (10.7)	14 (50.0)	8 (28.6)	3 (10.7)	
1 – 2 years	1 (3.2)	18 (58.1)	10 (32.3)	2 (6.5)	
Works full-time	7 (5.5)	63 (49.6)	46 (36.2)	11 (8.7)	0.88
Part-time	2 (5.1)	17 (43.6)	17 (43.6)	3 (7.7)	
Has own patient panel	5 (4.8)	50 (48.1)	40 (38.5)	9 (8.7)	0.99
Does not have own panel	3 (4.8)	30 (48.4)	24 (38.7)	5 (8.1)	
Panel size (mean, SD)	90 (\pm 14)	128 (\pm 128)	174 (\pm 255)	178 (\pm 149)	0.62
Level of confidence diagnosing RA					0.004
Very confident	2 (1.6)	58 (46.0)	53 (42.1)	13 (10.3)	
Somewhat or not particularly confident	6 (16.7)	19 (52.8)	10 (27.8)	1 (2.8)	

Abbreviation: NP, nurse practitioner; PA, physician assistant; SD, standard deviation; RA, rheumatoid arthritis

Table 3

Description of respondents' roles in rheumatology practices

	Total N = 174	NP N = 82	PA N = 89	P-value
Roles	<i>n (%)</i>			
Perform intake assessments	136 (78.2)	61 (74.4)	74 (83.2)	0.16
Conduct physical exams	169 (97.1)	81 (98.8)	85 (95.5)	0.21
Perform ultrasound (certified)	19 (10.9)	7 (8.5)	12 (13.5)	0.31
Perform BMD testing	12 (6.9)	2 (2.4)	10 (11.2)	0.025
Interpret bone density testing	111 (63.8)	42 (51.2)	67 (75.3)	0.001
Interpret and deliver tests	164 (94.3)	74 (90.2)	86 (96.6)	0.07
Treat patients	169 (97.1)	78 (95.1)	88 (98.9)	0.15
Give medication injections	116 (66.7)	52 (63.4)	61 (68.5)	0.48
Give IA steroid injection	145 (83.3)	63 (76.8)	78 (87.6)	0.06
Perform patient education	173 (99.4)	82 (100.0)	89 (100.0)	
Start patients on medications	166 (95.4)	78 (95.1)	85 (95.5)	0.91
Adjust medication dosages	171 (98.3)	81 (98.8)	87 (97.8)	0.61
Manage infusion clinic	39 (22.4)	25 (30.5)	13 (14.6)	0.01
Administrative practice roles	37 (21.3)	19 (23.2)	18 (20.2)	0.64
Conduct research studies	69 (39.7)	32 (39.0)	35 (39.3)	0.97
Patient visit context				
Sees patients at initial consult	130 (75.1)	60 (73.2)	68 (77.3)	0.53
Sees patients at follow up visit	173 (99.4)	82 (100.0)	88 (98.9)	0.34
Sees patients at urgent visit	157 (90.2)	75 (91.5)	80 (89.9)	0.73

Abbreviation: BMD, bone mineral density; IA, intra-articular

Table 4

Associations between knowledge of treat to target for rheumatoid arthritis and provider characteristics

	N (%)
Confidence diagnosing RA (N=169)	
Very confident	130 (76.9)
Somewhat confident	36 (21.3)
Not particularly confident	2 (1.2)
Not at all confident	1 (0.6)
Manages patient treatment (N=167)	158 (94.6)
Knows of TTT (N=167)	130 (77.8)
Practice uses TTT (N= 130)	98 (75.4)
Uses RA disease measures (N=170)	127 (74.7)
Measures used (N=172)	
DAS	37 (21.5)
CDAI	22 (12.8)
SDAI	10 (0.6)
HAQ	65 (37.8)
RAPID	40 (23.3)
Patient global	43 (25.0)
Physician global	37 (21.5)
Used any RA activity measure	84 (48.6)

Abbreviation: DAS, Disease Activity Score; CDAI, Clinical Disease Activity Index; SDAI, Simple Disease Activity Index; HAQ, Health Assessment Questionnaire; RAPID, Routine Assessment of Patient Index Data; TTT, Treat to Target; RA activity measure, DAS, CDAI, SDAI, or RAPID