RHEUMDOC
A One-Page RHEUMatology DOCtor Form with Four Physician Global Estimates for Overall Status, Inflammation, Damage, and Symptoms Based on Neither Inflammation nor Damage

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Abstract
A physician estimate of global status (DOCGL) is among the seven core data set measures to assess patients with rheumatoid arthritis (RA) and included in many rheumatic disease indices. In clinical trials designed to reduce inflammation, DOCGL is directed to estimate inflammatory activity. However, patients with inflammatory rheumatic diseases also may be affected by organ damage (e.g., to joints in RA, kidneys in SLE, muscles in polymyositis, and so forth.). Furthermore, fibromyalgia has been reported in 20% to 40% of patients with RA and other inflammatory rheumatic diseases, which may complicate their management. We sought to clarify a global summary of patient status by supplementing DOCGL with three additional separate (0-10) physician global estimates for inflammation (DOCINF), damage (DOCDAM), and neither inflammation nor damage (DOCNON) (often fibromyalgia, but may be other chronic pain or somatization syndromes). In analyses of new patients with six diagnoses, mean overall DOCGL scores were highest for patients with fibromyalgia, followed by RA, spondyloarthropathy, osteoarthritis, gout, and systemic lupus erythematosus. Among the three subscales, mean DOCINF scores were highest in RA, spondyloarthropathy, gout, and systemic lupus erythematosus; mean DOCDAM highest in osteoarthritis; and mean DOCNON in fibromyalgia. In patients with RA, mean DOCDAM and DOCNON scores indicated coexistence of clinically important damage or fibromyalgia in some patients. These data indicate face validity of the three physician global estimates on subscales for inflammation, damage, and symptoms due to neither inflammation nor damage. These estimates reflect the expertise of the rheumatologist and may be helpful to interpret rheumatic disease indices.

Quantitative assessment of many rheumatic diseases requires a pooled index of several measures, as no single measure can serve as a gold standard for all individual patients, analogous to blood pressure or bone densitometry. Formal indices have been developed for rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), vasculitis, psoriatic arthritis, ankylosing spondylitis (AS), and other rheumatic diseases. These indices generally include 3 types of measures, from patient self-report, physician assessment, and laboratory tests; some also include imaging data.

Inclusion of patient history information and specific physical examination findings (e.g., joint count) in rheumatoid disease indices reflects that a patient history and physical examination is more significant in clinical decisions in RA than in many other types of chronic diseases. The relative importance of the patient history and physical examination appears to pertain to most rheumatic diseases, as no specific available biomarker is applicable to all individual patients. Formal indices are used in all clinical trials and other clinical research but not widely in routine clinical care.

Many rheumatology indices include a physician estimate of global status (DOCGL). [The abbreviation “DOCGL” rather than “PGA” is used to avoid confusion, as “PGA” appears in the rheumatology literature to represent either (or both) patient and physician estimates of disease activity.] DOCGL is included among the 7 measures in the core data set for RA. DOCGL distinguishes active from control treatments in randomized controlled clinical trials of methotrexate, leflunomide, abatacept, adalimumab, and certolizumab.

generally at levels of significance as high as or higher than any of the other 6 RA core data set measures, including joint counts and laboratory acute phase reactants.

The relative efficiency of DOCGL to distinguish active from control treatments in RA clinical trials may appear remarkable, as this measure appears the least studied and characterized of all the 7 core data set measures. DOCGL traditionally has been directed to estimate inflammatory activity, particularly in clinical trials designed to reduce inflammation. However, patients with inflammatory rheumatic diseases also may be affected by organ damage (e.g., to joints in RA, kidneys in SLE, muscles in polymyositis, etc.). Furthermore, fibromyalgia has been reported in 20% to 40% of patients with RA, and chronic pain and fatigue of a non-inflammatory etiology may complicate management of inflammatory rheumatic diseases. A recent report indicates that joint damage and fibromyalgia were two of the primary reasons for rheumatologists not intensifying treatment in a “treat to target” strategy for patients with RA whose DAS28 scores indicated moderate or high disease activity.

Some rheumatologists may take into consideration damage and symptoms not explained by inflammatory markers or organ damage (such as fibromyalgia) in estimating DOCGL, while others may consider only inflammation. An approach to clarify this matter toward standardization is for physicians to record 4 global estimates, not only overall DOCGL, but also 3 additional separate global estimates: for inflammation—or reversible problems (DOCINF); damage—or irreversible problems (DOCDAM); and neither (DOCNON)—often fibromyalgia, but other chronic pain or somatization syndromes as well (Fig. 1). Each of these estimates is completed by the physician on a 0-10 scale composed of 21 circles in increments of 0.5 at each circle.

Patients were classified into six categories by the treating rheumatologist (MB): RA, osteoarthritis (OA), fibromyalgia, SLE, spondyloarthropathy (SPA), and gout. Patients in whom these diagnoses were not assigned were classified as “other” and not included in the analyses. Mean scores for the DOCGL, DOCINF, DOCDAM, and DOCNON were compared in the six different diagnostic groups. A waiver was obtained from the institutional review board (IRB) of the Mercy Health System. The analyses presented were from a retrospective chart review of de-identified, prospectively-collected data.

Methods
Quantitative clinical rheumatology is practiced in routine care at this setting. A multidimensional assessment questionnaire (MDHAQ) is completed by each patient at each visit, to provide quantitative medical history information. A RHEUMatology DOCTOR (RHEUMDOC) form is completed by the rheumatologist on each patient at each visit to record quantitatively the impressions of the physician based on physical examination and all other information. RHEUMDOC includes four global estimates by the physician: 1. overall DOCGL; 2. inflammation, i.e., reversible symptoms and signs (DOCINF); 3. damage, i.e., irreversible symptoms and signs (DOCDAM); and 4. “neither” (DOCNON), i.e., clinical problems not explained by inflammation or damage—often fibromyalgia, but other chronic pain or somatization syndromes as well. Each of these estimates is completed by the physician on a 0-10 scale composed of 21 circles in increments of 0.5 at each circle.

Results
Between 2008 and 2012, 197 new patients with the 6 diagnoses (not including patients with other diagnoses) were seen at this setting, including 48 with RA, 67 with OA, 15

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**Figure 1** Four physician global estimates: **a)** overall global assessment; **b)** degree of inflammation; **c)** degree of joint or organ damage; **d)** degree of symptoms due to neither inflammation nor damage.
with fibromyalgia, 13 with SLE, 23 with SPA, and 31 with gout. Demographic data appear typical for patients in these diagnostic groups (Table 1). Mean overall DOCGL scores were highest for patients with fibromyalgia (4.53), followed by RA (3.90), SPA (3.61), OA (3.28), gout (2.36) and SLE (2.23) (Table 2).

Among the 3 subscales, mean DOCINF scores were the highest in RA (4.35), SPA (4.35), gout (2.64), and SLE (2.28), while DOCDAM was highest in patients with OA (3.56), and DOCNON in patients with fibromyalgia (6.13). These data indicate face validity of the 3 subscales for DOCINF, DOCDAM, and DOCNON.

In patients with RA, mean DOCDAM scores were 2.8 (about 50% of DOCINF scores of 4.35), and mean DOCNON scores were 0.91 (about 20% of mean DOCINF scores). Mean DOCDAM scores were greater than 1 in patients with SPA and fibromyalgia. Mean DOCNON scores were greater than 1 in patients with SLE and SPA. These data suggest that many patients with inflammatory rheumatic diseases may have clinically important damage or fibromyalgia.

## Discussion

These observations suggest that estimates beyond DOCGL for DOCINF, DOCDAM, and DOCNON may be helpful to rheumatologists to increase awareness of inflammation, damage, or fibromyalgia, or problems in two or three of these domains, affecting DOCGL in patients with rheumatic diseases. These estimates may allow DOCGL to be useful in all rheumatic diseases, such as osteoarthritis and fibromyalgia. They may be particularly informative in patients with inflammatory diseases who also have damage or fibromyalgia.

Analyses of an RA registry from Australia indicates that joint damage and fibromyalgia are two of the three most prominent reasons for non-intensification of therapy in patients with RA who had moderate or severe disease activity according to DAS28 (the third is patient choice). Routine scoring of DOCINF, DOCDAM, and DOCNON may be helpful to recognize and document these problems prospectively in usual rheumatology care.

The results extend earlier results from a cohort of 478 new patients with these 6 diagnoses who were seen at a weekly rheumatology academic setting between 1996 and 2007, including 174 with RA, 32 with OA, 196 with fibromyalgia, 34 with SLE, 30 with SPA, and 12 with gout (Table 3). Although most scores were 2 to 3 units higher than those reported here (Tables 2 and 3). The highest mean DOCGL scores were remarkably identical at 6.3 for RA, OA, SPA, and FM, with lower scores for SLE and gout. Highest scores in this database also were seen for DOCINF.

### Table 1
Demographic Data Concerning 197 New Patients in 6 Diagnostic Categories: Rheumatoid Arthritis (RA), Osteoarthritis (OA), Fibromyalgia (Fibro), Systemic Lupus Erythematosus (SLE), Spondyloarthropathy (SPA), and Gout

<table>
<thead>
<tr>
<th>Patient characteristic</th>
<th>RA (N = 48)</th>
<th>OA (N = 67)</th>
<th>Fibro (N = 15)</th>
<th>SLE (N = 13)</th>
<th>SPA (N = 23)</th>
<th>Gout (N = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>60.6</td>
<td>68</td>
<td>51.6</td>
<td>45.8</td>
<td>50.8</td>
<td>60.8</td>
</tr>
<tr>
<td>Sex, % female</td>
<td>85.7%</td>
<td>73.1%</td>
<td>93.3%</td>
<td>84.6%</td>
<td>56.5%</td>
<td>40.6%</td>
</tr>
<tr>
<td>Disease duration, years</td>
<td>5.8</td>
<td>4.99</td>
<td>4.1</td>
<td>9.4</td>
<td>4.5</td>
<td>2.4</td>
</tr>
<tr>
<td>Patient global estimate (0-10 scale)</td>
<td>3.90</td>
<td>3.29</td>
<td>4.53</td>
<td>2.23</td>
<td>3.61</td>
<td>2.36</td>
</tr>
</tbody>
</table>

Data presented as mean except where otherwise indicated.

### Table 2
Mean Physician Scores and Ranges in 197 New Patients in 6 Diagnostic Categories: Rheumatoid Arthritis (RA), Osteoarthritis (OA), Fibromyalgia (Fibro), Systemic Lupus Erythematosus (SLE), Spondyloarthropathy (SPA), and Gout

<table>
<thead>
<tr>
<th>Physician scores</th>
<th>RA (N = 48)</th>
<th>OA (N = 67)</th>
<th>Fibro (N = 15)</th>
<th>SLE (N = 13)</th>
<th>SPA (N = 23)</th>
<th>Gout (N = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician global (0-10 scale)</td>
<td>3.90</td>
<td>3.28</td>
<td>4.53</td>
<td>2.23</td>
<td>3.61</td>
<td>2.36</td>
</tr>
<tr>
<td>Inflammation (0-10 scale)</td>
<td>4.35</td>
<td>0.79</td>
<td>0.94</td>
<td>2.28</td>
<td>4.35</td>
<td>2.64</td>
</tr>
<tr>
<td>Damage (0-10 scale)</td>
<td>2.18</td>
<td>3.56</td>
<td>1.65</td>
<td>0.76</td>
<td>1.65</td>
<td>0.44</td>
</tr>
<tr>
<td>Non-inflammatory/ non-damage (0-10 scale)</td>
<td>0.91</td>
<td>0.97</td>
<td>6.13</td>
<td>1.02</td>
<td>1.35</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Bold = highest score in each diagnostic category. Note that at least one of the three physician subscale scores was within 1 unit of the physician global score in each diagnostic category except fibromyalgia.
in RA, SPA, and gout; for DOCDAM in OA; and DOCNON in fibromyalgia (FM)\(^4\) (Table 3). In patients with RA, mean DOCDAM was 5.0 and DOCNON 4.0, again suggesting considerable joint damage and fibromyalgia in many RA patients.

It may be thought that non-inflammatory problems of damage or fibromyalgia would affect primarily an RA index based only on patient self-report measures, such as RAPID3 (routine assessment of patient index data 3 - based on scores for physical function, pain, and patient estimate of global status), in contrast to DAS28 (disease activity score with a 28 joint count)\(^4\) or CDAI (clinical disease activity index),\(^5\) which include formal joint counts. However, DAS28 and CDAI, as well as RAPID3 scores, all may suggest high disease activity as a result of damage or fibromyalgia.

For example (Table 4), a patient who might have no swollen joints at all and an ESR of 20, but 28 tender joints and PATGL of 10, characteristic of a patient with fibromyalgia, would have a RAPID3 score of up to 20, DAS28 of 6.1, and a CDAI of 38, all indicating high activity, although there are no swollen joints and DOCGL is 0. Even a patient with 14 tender joints and PATGL of 10, but no swollen joints and an ESR of would have DSA28 of 5.1 and CDAI of 27, indicating high disease activity (Table 4). These scores in patients with fibromyalgia on DAS28, CDAI, and RAPID3 all might be interpreted as indicating high activity and a need for intensification of therapy for which RHEUMDOC estimates for DOCNON might be helpful to recognize as not appropriate.

As noted, the expertise of a rheumatologist is both to quantitatively assess the level of pain, fatigue, or other problems, and also to identify the extent to which a patient’s problems may result from inflammation, damage, or neither. This report suggests face validity for four estimates for DOCGL, DOCINF, DOCDAM, and DOCNON in a private practice rheumatology clinical setting, extending similar results from an academic setting. In addition, the discipline of completing these scores can be valuable to the rheumatologist in helping to formulate clinical decisions. Further analyses using the DOCGL subscales appear indicated to add quantitative data to narrative descriptions in order to better characterize status of patients with rheumatic diseases.

**Disclosure Statement**

None of the authors have a financial or proprietary interest in the subject matter or materials discussed, including, but

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**Table 3** Mean Physician Scores in 478 New Patients (seen by TP from 1996-2007) in 6 Diagnostic Categories: Rheumatoid Arthritis (RA), Osteoarthritis (OA), Fibromyalgia (Fibro), Systemic Lupus Erythematosus (SLE), Spondyloarthropathy (SPA), and Gout\(^4\)

<table>
<thead>
<tr>
<th>Physician scores</th>
<th>RA (N = 174)</th>
<th>OA (N = 32)</th>
<th>Fibro (N = 196)</th>
<th>SLE (N = 34)</th>
<th>SPA (N = 30)</th>
<th>Gout (N = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician global (0-10 scale)</td>
<td>6.3*</td>
<td>6.3*</td>
<td>6.3*</td>
<td>5.0*</td>
<td>6.3*</td>
<td>5.0*</td>
</tr>
<tr>
<td>Inflammation (0-10 scale)</td>
<td>7.0*</td>
<td>3.3</td>
<td>2.3</td>
<td>3.6</td>
<td>7.7*</td>
<td>6.0*</td>
</tr>
<tr>
<td>Damage (0-10 scale)</td>
<td>5.0*</td>
<td>6.0*</td>
<td>1.7</td>
<td>2.3</td>
<td>4.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Non-inflammatory/ non-damage (0-10 scale)</td>
<td>4.0</td>
<td>3.7</td>
<td>9.0*</td>
<td>6.3*</td>
<td>4.0</td>
<td>2.3</td>
</tr>
</tbody>
</table>

*Mean physician scores ≥ 5.

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**Table 4** Results of DAS28, CDAI, and RAPID3 in Two Patients with Fibromyalgia

<table>
<thead>
<tr>
<th>Patient/ Index</th>
<th>RA Core Data Set Measures</th>
<th>Index Score</th>
<th>Activity/ Severity Category</th>
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</thead>
<tbody>
<tr>
<td>TJC28</td>
<td>SJC28</td>
<td>DOCGL</td>
<td>ESR</td>
</tr>
<tr>
<td>Patient 1</td>
<td>28</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DAS28</td>
<td>28</td>
<td>0</td>
<td>–</td>
</tr>
<tr>
<td>CDAI</td>
<td>28</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RAPID3</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Patient 2</td>
<td>14</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>DAS28</td>
<td>14</td>
<td>0</td>
<td>–</td>
</tr>
<tr>
<td>CDAI</td>
<td>14</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>RAPID3</td>
<td>–</td>
<td>–</td>
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References


