Table 1. A) Disease activity categories by SDAI-Q vs. SDAI; B) Disease activity categories by SDAI-Q vs. CDAI

		SDAI-Q (n = 100)			
		Remission (≤ 3.3)	Low Disease Activity (> 3.3 and ≤ 11)	Moderate Disease Activity (> 11 and ≤ 26)	High Disease Activity (> 26)
SDAI	Remission (≤ 3.3)	28 (28.0%)			
	Low Disease Activity (> 3.3 and ≤ 11)		31 (31.0%)		
	Moderate Disease Activity (> 11 and ≤ 26)			35 (35.0%)	
	High Disease Activity (> 26)				6 (6.0%)
		SDAI-Q (n = 100)			
		Remission (≤ 3.3)	Low Disease Activity (> 3.3 and ≤ 11)	Moderate Disease Activity (> 11 and ≤ 26)	High Disease Activity (> 26)
CDAI	Remission (≤ 2.8)	26 (26.0%)			
	Low Disease Activity (> 2.8 and ≤ 10)	2 (2.0%)	28 (28.0%)	2 (2.0%)	
	Moderate Disease Activity (> 10 and ≤ 22)		3 (3.0%)	33 (33.0%)	
	High Disease Activity (> 22)				6 (6.0%)

Fields highlighted in red indicate that disease activity categories do not match. SDAI = Simplified Disease Activity Index; SDAI-Q = SDAI calculated with a quick quantitative CRP assay; CDAI = Clinical Disease Activity Index.

Figure 1. Bland-Altman plot for SDAI and SDAI-Q Acknowledgements

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POS0454

COMPARISON OF MBDA SCORE, PATIENT GLOBAL ASSESSMENT AND EVALUATOR GLOBAL ASSESSMENT FOR PREDICTING RISK OF RADIOGRAPHIC PROGRESSION

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Background: Busy rheumatologists may assess disease activity and risk for radiographic progression (RP) in RA with informal, qualitative versions of evaluator and/or patient global assessments (EGA and PGA). RA patient care may be improved by having a convenient, objective disease activity measure that predicts risk for RP more accurately than EGA or PGA.

Objectives: To compare the abilities of MBDA score, patient global assessment and evaluator global assessment to assess risk for radiographic progression (RP), and to assess the ability of MBDA score to predict RP among patients with concordant or discordant PGA and EGA.

Methods: Patients were pooled from two RCTs of patients with recent onset RA treated with conventional and biologic DMARDs (OPERA and SWEFOT, N=386) and from a registry of patients with predominantly established RA and diverse treatments (BRASS, N=380). Pearson correlations were determined between MBDA scores (adjusted for the effects of age, sex and adiposity) (scale 1-100), PGA and EGA (each on a scale of 1-10) at baseline. PGA and EGA were considered discordant when they differed by >2.5 . Univariable logistic regression assessed ability to predict RP (change in TSS >5 over 1 year) for MBDA score, PGA and EGA as continuous variables; and for discordance of PGA and EGA as 2-level (concordant vs. discordant) or 3-level (PGA>EGA, concordant, EGA>PGA) categorical variables. Multivariable regression considered the main effect and interaction terms of the MBDA score, as a continuous variable, paired with each other variable, to test the ability of each pair to assess risk of RP. All models included a random effect on cohort. Odds ratios were reported for every 10-unit increase in MBDA score. Frequency of RP was determined in subgroups with MBDA score low (<30), moderate (30-44) or high (>44) for patient groups based on PGA/EGA concordance or discordance.

Results: The 766 patients studied were 76% female, 76% positive for RF and/or anti-CCP Ab, with mean age 55 years, DAS28-CRP 4.7, CRP 22 mg/L, CDAI 26, SJC 9.1, PGA 4.4, EGA 3.4, MBDA score 53. No interaction was seen between MBDA score and type of cohort (early vs established RA). PGA and EGA were discordant in 294 of 766 (38%) patients and were weakly to moderately correlated ($r=0.38$). Among discordant patients, PGA was $>$ EGA in 227 cases and EGA was $>$ PGA in 67 cases. Correlations between MBDA score and PGA or EGA were $r=0.41$ and $r=0.34$, respectively. In univariable analyses, MBDA score was a statistically significant predictor of radiographic progression (OR=1.53, $p=6.3 \times 10^{-8}$) whereas PGA, EGA, 2-level discordance and 3-level discordance were not ($p=0.38$, 0.47, 0.74, 0.83, respectively). In multivariable analyses, significant interactions were observed between MBDA score and discordance (2-level, $p=0.0029$; 3-level, $p=0.0087$). The interaction analysis demonstrated, in PGA/EGA-concordant patients, low risk of radiographic progression when MBDA score was low and elevated risk when it was high (OR=1.33 [1.1, 1.59]). A relationship between MBDA score and RP risk was also demonstrated, with heightened trend, among discordant patients with PGA $>$ EGA (OR=2.04 [1.53, 2.81]) and EGA $>$ PGA (OR=3.43 [1.37, 13.8]) (Figure 1).

Conclusion: MBDA score was a significant predictor of radiographic progression, whereas PGA and EGA were not. MBDA score predicted progression whether PGA and EGA were concordant or discordant. These results suggest that MBDA score detects joint-damaging disease activity more accurately than PGA and EGA and it does so whether or not PGA and EGA are in agreement.

Figure 1. Rate of radiographic progression (RP) by MBDA category for patient groups based on concordance or discordance of Patient Global Assessment (PGA) and Evaluator Global Assessment (EGA).

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POS0455

EFFECT OF ANTI-RO/SSA ANTIBODIES FOR TREATMENT RESPONSE TO METHOTREXATE IN RHEUMATOID ARTHRITIS: A RETROSPECTIVE MULTICENTER OBSERVATIONAL STUDY

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Background: Several previous observational studies have suggested that patients with anti-Ro/SSA antibody-positive rheumatoid arthritis (RA) may respond poorly to treatment, including tumor necrosis factor inhibitors¹. However, its influence on methotrexate (MTX) treatment, which is the anchor drug of treat-to-target strategy in RA treatment, remains unclear.
Objectives: We compared the clinical response to MTX in both anti-Ro/SSA antibody-positive and -negative patients with MTX-naïve RA and investigated the reasons for the difference in response.
Methods: We recruited 210 consecutive patients with RA who were newly started on MTX in this retrospective cohort study. The effect of the presence of anti-Ro/SSA antibodies on achieving low disease activity (LDA) of DAS28-CRP at six months after initiating MTX was investigated by using logistic regression analysis. CDAI, SDAI, concomitant using DMARDs and painkillers, patient's and evaluator's VAS, tender joint counts, and swollen joint counts at six months were also compared between the anti-Ro/SSA-positive patients and -negative

patients. Missing data were imputed by using multiple imputations before multivariate analysis.
Results: 32 anti-Ro/SSA antibody-positive patients and 178 anti-Ro/SSA antibody-negative patients were included. The rate of achieving DAS28-LDA at six months was significantly lower in the anti-Ro/SSA antibody-positive patients than those in the anti-Ro/SSA antibody-negative patients (56.2% versus 75.8%, $P=0.03$). In the logistic regression analysis, the presence of anti-Ro/SSA antibodies was an independent negative predictor for achieving DAS-28-LDA at six months (OR:0.431, 95%CI: 0.190-0.978, $P=0.044$) (Table1). Anti-Ro/SSA antibody-positive patients had significantly higher patient's VAS at six months (median [IQR]: 22 [15-41] vs 19 [5-30], $P=0.038$), and prescribed NSAIDs (37.5% vs 18.0%, $P=0.018$). CDAI and SDAI after six months were not significantly different between the group.
Conclusion: The presence of anti-Ro/SSA antibodies might be one of the predictive factors for the insufficient response to treat to target strategy in RA treatment. Residual pain was suspected as one of the mechanisms contributing to the lesser clinical response of MTX in anti-Ro antibody-positive RA.
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Table 1. Logistic regression analysis for the rate of achieving DAS28 low disease activity at six months.

Risk factor	Odds ratio	95%CI	P value
Age at onset	0.993	0.968-1.018	0.586
Sex (woman)	0.643	0.300-1.384	0.258
RF-positive	1.962	0.853-4.511	0.112
ACPA-positive	0.552	0.225-1.351	0.192
Anti-Ro/SSA antibody-positive	0.431	0.190-0.978	0.044

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POS0456

EXTERNAL VALIDATION OF A MULTI-BIOMARKER-BASED CARDIOVASCULAR DISEASE RISK PREDICTION SCORE FOR RHEUMATOID ARTHRITIS PATIENTS

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Background: A novel score for predicting 3-year risk for CVD events in RA patients combines age, four traditional CVD risk factors (diabetes, hypertension, smoking, history of high-risk CVD event), a personalized assessment of RA-related inflammation based on the multi-biomarker disease activity (MBDA) score and, individually, 3 of its 12 biomarkers, TNF-R1, MMP-3 and leptin (log-transformed). This score was developed and internally validated using patient data from the Medicare database.
Objectives: The purpose of this analysis was to externally validate the MBDA-based CVD risk prediction score in a younger cohort from the Symphony claims database.
Methods: A cohort of patients greater than or equal to 18 years old with RA diagnosis from a rheumatologist and evidence of an RA-specific treatment, excluding patients with malignancy, past myocardial infarction (MI) or stroke, was created by a third party (Symphony) by matching medical and pharmaceutical claims and linking them to MBDA scores from a database of tests done for routine care. Medicare patients were excluded to avoid overlap with the internal validation cohort. Only the first MBDA test was used for each patient. The study endpoint was time from MBDA testing to first CVD event within a 3-year time horizon. CVD event was defined as MI or stroke, based on ICD-9 or ICD-10 diagnosis codes in hospital claims. Analyses focused on relative risk, not absolute risk, because CVD event data in Symphony may be incomplete. A univariate Cox proportional hazards regression model was fit with the MBDA-based CVD risk score as the sole predictor of time to CVD event to obtain a hazard ratio (HR) estimate (95% CI) and p-values from a likelihood ratio test (LRT). Sensitivity analyses determined HR for patient subgroups, with p-values determined for the interaction between subgroups and the MBDA-based CVD risk score. Using a multivariate Cox proportional hazard regression model, the MBDA-based CVD risk score was compared to a simpler model that included only age, sex, diabetes, hypertension, history of other CVD, smoking and CRP (log-transformed) for ability to predict time to a CVD event.
Results: 48,868 patients with 337 CVD events met eligibility criteria and had linked biomarker data. Mean age was 54.4 years. 81.7% were female (Table 1).