Figure 1. Adjusted odds ratio of achieving MCID CDAI or modified ACR20/50/70 at 6 months after initiation of abatacept by line of therapy (primary cohort)

*Estimated by multiple logistic regression analysis adjusted for age, sex, disease duration, work status, SC modules, history of hypertension and depression, BL CDAI, BL patient-reported pain and BL fatigue (factors that were selected a priori based on clinical experience or differed significantly by line of therapy); p values reflect overall difference across lines of therapy.
^bReduction in CDAI score of 2 if BL disease activity was low (CDAI score ≤10); of 6 if BL disease activity was moderate (CDAI score >10 and ≤22); and of 11 if BL disease activity was high (CDAI score >22).
^cModified ACR criteria is based on 2 out of 4 measures (not using ESR or CRP).
 Modified ACR20/50/70=20/50/70% improvement in modified ACR criteria; MCID=minimal clinically important difference; OR=odds ratio.

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AB0203

EFFECT OF DOSE ESCALATION OF SUBCUTANEOUS TOCILIZUMAB ON DISEASE ACTIVITY IN PATIENTS WITH RHEUMATOID ARTHRITIS IN A RANDOMIZED CONTROLLED TRIAL

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Background: In patients with RA, subcutaneous tocilizumab (TCZ-SC) is administered every 2 weeks (q2w) or every week (qw), based on the patient's weight and clinical response.

Objectives: To compare the effects on disease activity at week 24, when the dosing schedule of TCZ-SC was escalated from q2w to qw, in patients who did not achieve LDA (DAS28-ESR > 3.2) at week 12 in COMP-ACT with patients who, despite not achieving LDA, continued TCZ-SC qw in SUMMACTA and q2w in BREVACTA.

Methods: US patients in COMP-ACT who weighed < 100kg at baseline and who received TCZ-SC 162mg q2w + methotrexate escalated to qw if they did not achieve LDA at week 12. DAS28-ESR remission (< 2.6) and LDA (< 3.2), CDAI remission (< 2.8) and LDA (< 10) and SDAI remission (< 3.3) and LDA (< 11) at week 24 were compared between patients who switched from q2w to qw and North American patients in SUMMACTA who initiated TCZ qw + csDMARDs and continued a qw dose (baseline body weight < 100kg and DAS28 > 3.2 at week 12). A secondary analysis compared COMP-ACT patients who escalated from q2w to qw with all SUMMACTA patients who continued a qw dose and all BREVACTA patients who initiated a TCZ-SC q2w dose + csDMARDs and continued a q2w dose (baseline body weight < 100kg and DAS28 > 3.2 at week 12). DAS28 was standardized to DAS28-ESR, and comparisons were calculated using a mixed model with repeated-measures logistic regression, including the following covariates: CDAI, SDAI and/or DAS28 at the reference visit (week 12),

as well as study baseline values of CDAI, SDAI and/or DAS28, baseline age, sex, TNFi use prior to the study (yes or no) and weight category.

Results: A total of 328 US patients in COMP-ACT did not achieve LDA at week 12 and escalated from q2w to qw TCZ-SC. In SUMMACTA, 285 patients did not achieve LDA at week 12 and continued TCZ-SC qw, of whom 71 were from North America. Baseline demographic and clinical characteristics were comparable between patients in COMP-ACT and North American patients in SUMMACTA. A significantly higher proportion of patients in COMP-ACT achieved DAS28-ESR, CDAI and SDAI remission and LDA 12 weeks after TCZ dose escalation (week 24) than North American SUMMACTA patients (Table 1). Similar results were seen when the proportion of patients who achieved DAS28 remission and LDA was compared at week 24 between patients in COMP-ACT and patients from all geographic regions who did not escalate dosing in SUMMACTA and BREVACTA (N=196).

Conclusion: US patients with RA who did not achieve LDA and escalated from q2w to qw TCZ-SC at week 12 in COMP-ACT had better disease activity outcomes at week 24 than North American patients who did not achieve LDA and continued qw dosing in SUMMACTA. These results provide some evidence that escalation from q2w to qw has more effect than expected without dose change for patients who do not achieve LDA by week 12.

Table 1. Comparison at Week 24 of Clinical Response After Week 12 Dose Escalation or Continuation Between Patients Who Did Not Achieve LDA at Week 12

	All COMP-ACT (N = 328)	North American SUMMACTA (n = 71)	All SUMMACTA (N = 285)	All BREVACTA (N = 196)
DAS28-ESR remission, n (%)	66 (20.1)	7 (9.9)	44 (15.4)	36 (18.4)
Adjusted OR (95% CI)	Ref	5.76 (1.92, 17.32)	3.29 (2.11, 5.12)	2.35 (1.44, 3.84)
P value	Ref	0.0018	< 0.0001	0.0006
DAS28-ESR LDA, n (%)	122 (37.2)	17 (23.9)	90 (31.6)	60 (30.6)
Adjusted OR (95% CI)	Ref	3.36 (1.61, 7.00)	2.81 (1.97, 4.01)	2.24 (1.50, 3.33)
P value	Ref	0.0012	< 0.0001	< 0.0001
CDAI remission, n (%)	12 (3.7)	2 (2.8)	13 (4.6)	11 (5.6)
Adjusted OR (95% CI)	Ref	4.50 (1.32, 15.32)	2.93 (1.37, 6.27)	1.45 (0.69, 3.05)
P value	Ref	0.0161	0.0056	0.3325
CDAI LDA, n (%)	80 (24.4)	11 (15.5)	81 (28.4)	66 (33.7)
Adjusted OR (95% CI)	Ref	4.19 (1.88, 9.35)	2.35 (1.63, 3.39)	1.32 (0.88, 1.97)
P value	Ref	0.0005	< 0.0001	0.1825
SDAI remission, n (%)	16 (4.9)	2 (2.8)	15 (5.3)	11 (5.6)
Adjusted OR (95% CI)	Ref	5.23 (1.44, 19.01)	3.23 (1.54, 6.76)	1.64 (0.81, 3.30)
P value	Ref	0.0120	0.0019	0.1670
SDAI LDA, n (%)	89 (27.1)	11 (15.5)	91 (31.9)	72 (36.7)
Adjusted OR (95% CI)	Ref	4.68 (2.20, 9.99)	2.20 (1.56, 3.11)	1.47 (0.99, 2.17)
P value	Ref	< 0.0001	< 0.0001	0.0540

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AB0204

THE PROPER STUDY: INTERIM ANALYSIS OF A PAN-EU REAL-WORLD STUDY OF SB5 BIOSIMILAR FOLLOWING TRANSITION FROM REFERENCE ADALIMUMAB IN PATIENTS WITH RHEUMATOID ARTHRITIS, AXIAL SPONDYLOARTHRITIS, OR PSORIATIC ARTHRITIS

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	RA (N=201)		axSpA (N=134)		PsA (N=169)	
	Mean (SD)	Q1, Q3	Mean (SD)	Q1, Q3	Mean (SD)	Q1, Q3
Age at SB5 initiation (years)	60.2 (11.7)	53, 68	50.5 (13.6)	38, 61	53.0 (12.2)	43, 62
Duration of disease (years)	13.5 (11.7)	4.5, 20	18.7 (13.2)	9, 25	12.7 (9.9)	4, 20
	n	%	n	%	n	%
Women	144	71.6	41	30.6	77	45.6
SB5 Dosing regimen:	149	74.1	120	89.6	156	92.3
Baseline 40mg Q2W						
Week 48 40mg Q2W	69	77.5	67	85.9	98	92.5
Baseline Other*	52	25.9	14	10.4	13	7.7
Week 48 Other*	20	22.4	11	14.1	8	7.5
Disease Score						
(paired patients)	DAS28	FFbH	BASDAI		Tender Joint Count	Swollen Joint Count
Baseline, n, mean (95% CI)	69 2.5 (2.3–2.7)	22 73.9 (65.6–82.1)	42 2.8 (2.3–3.4)	49 1.8 (0.1–3.0)	49 0.6 (0.2–0.9)	
Week 48, n, mean (95% CI)	69 2.6 (2.3–2.8)	22 72.1 (64.0–80.2)	42 3.0 (2.4–3.7)	49 1.9 (0.5–3.3)	49 0.6 (0.1–1.1)	
Patient diagnosed with COVID-19 at any time on-study, n (%)						
No	142	95.3	96	88.1	140	98.6
Yes	3	2.0	1	0.9	1	0.7
Unknown	4	2.7	12	11.0	1	0.7
Imraldi regimen stopped or changed due to COVID-19, regardless of diagnosis, n (%)						
No	130	98.5	106	97.2	134	100
Yes	2	1.5	3	2.8	0	0

SD standard deviation; Q1 1st quartile, Q3 3rd quartile; CI Confidence Interval*Other includes all other reported doses and/or dosing intervals: 40mg QW, 80mg Q2W, and unspecified frequency. DAS28 Disease Activity Score 28; FFbH Hanover Functional Ability Questionnaire; BASDAI Bath Ankylosing Spondylitis Disease Activity Index

Background: SB5, a biosimilar to reference adalimumab (ADL), received EU marketing authorisation in August 2017, based on the totality of evidence from pre-clinical and clinical Phase I and III studies that demonstrated bioequivalence, similar efficacy, and comparable safety and immunogenicity to the reference. This real-world study provides data on outcomes of the transition from reference to biosimilar ADL outside the controlled, randomised, clinical trial setting.

Objectives: To evaluate candidate predictors of persistence on SB5 in EU patients (pts) across multiple indications.

Methods: This ongoing observational study enrolled 1000 pts with rheumatoid arthritis (RA), axial spondyloarthritis (axSpA), psoriatic arthritis (PsA), ulcerative colitis, or Crohn's disease who initiated SB5 as part of routine clinical practice following a minimum of 16 weeks' treatment with reference ADL, at clinics in Belgium, Germany, Ireland, Italy, Spain, and the UK. Data are captured from clinic records retrospectively for the 24 weeks prior to transition, and prospectively and/or retrospectively for 48 weeks following transition. Primary outcome measures include baseline clinical characteristics, disease activity scores and clinical management over time; data on COVID-19 infection has recently been captured. This interim analysis (IA) provides an overview of baseline characteristics, disease scores and dose regimen up to 48 weeks post-initiation of SB5, and COVID-19 infection reported to date, in subjects with RA, axSpA, or PsA enrolled at 35 specialist sites and followed up to the data extract date of 18th December 2020.

Results: Of the 504 pts included in this IA, 201 have RA, 169 have PsA, and 134 axSpA. At time of data extract, 216 pts had completed 48 weeks on SB5, 73 pts had discontinued SB5, and 8 had discontinued the study.

Conclusion: This IA provides a first insight into clinical management of pts over 48 weeks, in a contemporary cohort of EU pts with established RA, axSpA and PsA, switched from reference to biosimilar ADL SB5 in clinical practice. The majority of pts showed no meaningful difference in disease score or dose regimen of SB5 by Week 48 post-transition. As of data extract date, the proportion of pts with a known positive COVID-19 test was low (1.3%) and a small minority (1.3%) had SB5 treatment changed or interrupted as a result of the COVID-19 pandemic. With follow-up of pts ongoing to Q4 2021, the study will continue to provide pertinent information about clinical outcomes of transition from reference to biosimilar ADL in real-world practice and in indications not investigated in controlled studies.

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AB0205

A NOVEL METHOD FOR PREDICTING 1-YEAR RETENTION OF ABATACEPT USING MACHINE LEARNING TECHNIQUES: DIRECTIONALITY AND IMPORTANCE OF PREDICTORS

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Background: In the ACTION (NCT02109666) study, multivariable Cox proportional hazards regression models showed that the predictors of 1-year retention to abatacept treatment were: patient global pain assessment, country, reason for stopping last biologic, number of prior biologic treatments, abatacept monotherapy, RF/anti-cyclic citrullinated peptide (CCP) status, previous neoplasms, psychiatric disorders and cardiac disorders.¹ Machine learning techniques, using the gradient-boosting model, subsequently identified additional predictors of abatacept retention in patients with moderate-to-severe RA enrolled in ACTION; however, the analysis did not show the directionality of the predictors.²

Objectives: To improve the clinical interpretability of the machine learning model in terms of directionality and the importance of each variable in predicting retention.

Methods: Previous analyses using the gradient-boosting model to identify predictors of abatacept retention at 1 year in the ACTION study have been described.² This analysis used SHapley Additive exPlanations (SHAP), a mathematical framework, to show how a particular predictor value influences prediction in the context of all other predictors. Higher SHAP values indicate a higher likelihood of retention. The contribution of every variable in the model's prediction (with the exception of country variables) was computed for each data point to capture individual variable impact. This enabled interpretation for level of importance and directionality at a patient level.

Results: Using data from 2350 patients enrolled in ACTION (May 2008 to December 2013), the mean retention rate at 1 year was 59.3% (n=1393). Overall variable importance is shown in Figure 1. After removal of country variables, the top five baseline predictors of retention were: no previous corticosteroid use, ACR functional class II, ≥2 prior biologic treatments prior to abatacept initiation, abatacept monotherapy and HAQ-DI. In terms of directionality, no previous corticosteroid use, ≥2 prior biologic treatments prior to abatacept initiation, abatacept monotherapy and a higher HAQ-DI score at baseline were associated with a lower likelihood of retention; ACR functional class II was associated with a higher likelihood of retention.