Table 1. Demographic data

Variable	Low disease activity	High disease activity
Mean age (years)	38.1	40.0
% Female	90.7	88.2
% White/Caucasian	76.7	67.7
Mean years diagnosed	5.5	5.0

Table 2. Propensity score matching results

Outcome variable	Low active- ity mean	High active- ity mean	Coefficient	95% CI	p-value
Flared in the last 12 months	11.63	37.97	-0.26	[-0.38 – -0.14]	<0.001
Number of flares in last 12 months	0.21	0.70	-0.49	[-0.72 – -0.26]	<0.001
Hospitalised in last 12 months	4.65	14.98	-0.10	[-0.17 – -0.04]	0.001
Number of consults in last 12 months	2.84	3.52	-0.68	[-1.19 – -0.17]	0.009
EQ-5D-3L	0.78	0.88	0.10	[0.03 – 0.17]	0.004
FACIT Fatigue	34.68	39.86	5.19	[0.80 – 9.57]	0.02
WPAI overall percentage work impairment	14.42	45.35	-30.93	[-45.32 – -16.54]	<0.001

Conclusion: Systemic lupus erythematosus patients with lower levels of disease activity are less burdensome to the healthcare system and experience a significantly better HRQoL and lower levels of productivity impairment. There is a need to establish a universal definition of low disease activity as a treatment goal to benefit patient quality of life and reduce HCRU.

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AB1171 EFFECTS OF SUCCESSIVE SWITCHES OF TWO DIFFERENT BIOSIMILARS OF ETANERCEPT ON OUTCOMES IN INFLAMMATORY RHEUMATIC DISEASES IN DAILY PRACTICE

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Background: A single switch from an originator to a biosimilar product has been shown to be safe and effective in the treatment of rheumatic musculoskeletal diseases (RMDs). The availability of biosimilars has created a financial incentive to encourage switching to cheaper products ("non-medical switch"). This is naturally associated with multiple switches. However, the effect of multiple switching between biosimilars of the same reference product has not been thoroughly investigated to date.

Objectives: To assess the effectiveness and safety of systematic non-medical switching from innovator etanercept (ETN) to biosimilar ETN (SB4) and successive to another biosimilar ETN (GP2015) in adult patients with rheumatoid arthritis (RA), psoriatic arthritis (PsA) or axial spondyloarthritis (axSpA) in a real-life setting.

Methods: This retrospective study was performed in a tertiary center in adult patients with RA, PsA or axSpA who had been treated with the innovator ETN and who had been switched to two ETN biosimilars for economic reasons thereafter. The first switch from innovator ETN to the first biosimilar ETN occurred between February-May 2017 and the second switch from the first to the second biosimilar ETN occurred between September-December 2017. The end of the observation period was October 2019. Disease activity, function and adverse events (AE) were regularly assessed, and any changes in outcome were recorded during the follow-up period. The scores documented at week 12 week after the second switch were taken as primary outcome. A total of 100 patients (54 RA, 27 axSpA, 19 PsA, mean age 54.3±15.1, 46% male) who switched twice to those ETN biosimilars over a follow-up period of 21.1±7.4 months were included. The retention rate after the second ETN biosimilar switch was 89% about 6 months after the second switch. While 2 patients were lost to follow-up and 1 patient died (cardiac arrest), 7 patients discontinued due to inefficacy or AE, including one pancreatic cancer. One patient was withdrawn due to pregnancy. Overall, 14 AEs were reported in 8 patients. Among them, 4 patients switched back to originator etanercept in month 6, 1 patient re-administered GP2015 successfully in month 3 after suffering from mucosal

erosions and in 3 patients another mode of action was prescribed. The scores at week 12 of both, disease activity and function, remained unchanged (Table 1).

Table 1. Patient characteristics

Assessment	Baseline (n=100)	SB4 Follow-up 12 weeks (n=100)	SB 4 Follow-up 24 weeks (n=100)	Second switch to GP2015 (n=100)	GP2015 Follow-up 12 weeks (n=97)	GP2015 Follow-up 24 weeks (n=89)
RA	DAS28 1.4 (0.8)	2.9 (1.4)	3.1 (1.2)	2.8 (1.4)	3.4 (2.5)	3.0 (1.4)
PsA	HAQ 3.8 (1.4)	1.6 (0.9)	1.0 (0.9)	1.5 (0.8)	1.5 (0.8)	1.6 (0.9)
axSpA	DAS28 1.2 (0.9)	1.9 (1.4)	2.8 (1.5)	3.1 (1.1)	4.5 (2.6)	3.6 (2.6)
	HAQ 5.1 (2.7)	1.0 (0.9)	0.9 (0.9)	1.0 (0.8)	1.0 (0.9)	1.2 (0.8)
	BASDAI 3.4 (0.8)	4.5 (2.6)	5.1 (3.8)	4.1 (2.2)	4.6 (2.5)	4.3 (2.4)
	ASDAS 4.4 (2.7)	2.5 (0.8)	2.7 (0.8)	3.2 (1.8)	2.7 (1.2)	2.5 (0.9)
	BASFI 4.4 (2.7)	4.3 (2.7)	4.3 (3.2)	4.6 (2.6)	4.5 (2.7)	4.8 (3.0)

*Values are mean ± standard deviation

Disclosure: Hexal funded this research

Conclusion: The retention rate after multiple switches from innovator ETN to two ETN biosimilars was close to 90%. No major changes in disease activity and function were observed in all three indications.

AB1172 IMPROVEMENT OF DEPRESSION BY JOINT SURGERY IN ESTABLISHED RHEUMATOID ARTHRITIS; RESULTS FROM MULTICENTER PROSPECTIVE COHORT STUDY FOR EVALUATION OF JOINT SURGERY ON PATIENT'S REPORTED OUTCOME

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Background: Total management including reconstructive joint surgery and rehabilitation should be needed for further improvements of physical function for long-standing RA patients. In these days, it is very important to evaluate the effectiveness of joint surgery as well as drug therapy based on patient-reported outcome (PRO)

Objectives: The purpose of this study is to explore the relationship among depression, clinical variables and other PROs including physical function and to explore whether joint surgery can improve the depression.

Methods: Multicenter prospective observational cohort study was conducted among patients who underwent elective joint surgery for RA from April 2012 to March 2016 (Study registration: UMIN00012649). In this study, we collected data at baseline and at 6 or 12 months after the surgery. These data were as follow; age, sex, disease duration, drug therapies, and disease activity (DAS), TUG, and patient-reported outcome [HAQ-DI, EQ-5D (QOL), pain and BDI-II (depression)]. Correlation between BDI-II and other variables were determined using multiple linear regression analysis.

Results: Totally, 346 patients before elective joint surgery were analyzed cross-sectionally. Mean age, disease duration, pain VAS, DAS28, HAQ-DI, EQ-5D and BDI-II were 64.2 years, 17.0 years, 36.2mm, 3.02, 1.11, 0.641 and 13.0, respectively. 52.6% of elective joint surgeries were in upper limbs and 47.4% were in lower limbs. Multiple linear regression analysis showed that HAQ-DI [B:-0.099 (95%CI:-0.117- -0.08) β:-0.48] pain VAS [B:-0.002 (95%CI:-0.002- -0.001) β:-0.26] and BDI-II [B:-0.003 (95%CI:-0.005- -0.002) β:-0.19] had significant impact on EQ-5D. Furthermore, HAQ-DI [B:3.78 (95%CI:2.54- 5.06) β: 0.33] and pain VAS [B: 0.062 (95%CI: 0.023- 0.101) β 0.17] had significant impact on BDI-II. Especially, walking and eating were independent factors for BDI-II in HAQ-DI categories. These results were confirmed in longitudinal analyses using results from joint surgery in lower limbs (LL; n=138) and upper limbs (UL; n=165), respectively. BDI-II was remarkably improved from 12.1 (mean) to 10.5 in LL and from 14.2 (mean) to 11.9 in UL. Change in HAQ-DI had significant impact on that in BDI-II [LL; B:3.183 (95%CI:0.301- 6.065) β:0.229, and UL; B:2.55 (95%CI:0.19- 4.92) β:0.19] while that in painVAS did not. Especially, the improving in walking category by LL [B:1.38 (95%CI:0.06- 2.70) β:0.18] and in hygiene category by UL [B:2.11 (95%CI:0.79- 3.42) β:0.24] were relevant factors for improving of BDI-II.

Conclusion: Depression is an important patient-reported outcome for QOL in established RA patients. Improving of physical function with joint surgery in both lower and upper limbs caused improving of depression status. Rheumatologists should take the joint surgery into consideration as effective intervention for treatment of established RA patients with treatment.

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AB1173

RHEUMATOLOGIST CARE IS ASSOCIATED WITH FEWER EMERGENCY ROOM VISITS BY PERSONS WITH GOUT

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Background: Gout is one of the most common inflammatory arthropathies. By searching a large administrative data base (Symphony Integrated Database), we found that persons with acute gout see a rheumatologist infrequently, whereas less than 50% of advanced gout patients are seen by a rheumatologist. Notably, however, gout patients seen by rheumatologists have more frequent urate measurements and are prescribed urate lowering therapy more frequently. This study sought to determine whether involvement of a rheumatologist in gout care had a positive impact on health outcomes

Objectives: To determine whether involvement of a rheumatologist had a positive impact on health outcomes of patients with gout.

Methods: We carried out a retrospective analysis to identify persons with gout over an approximately 3-year period from October 2015 to December 2018. This study used data from the Truven Marketscan[®] database, an administrative database covering over 190 million patients across the United States and based on fully adjudicated and paid insurance claims. Patients were identified as having gout if they were >18 years of age and had at least two medical claims for the diagnosis of gout on different days, separated by at least 3 months. Patients with acute gout were identified by ICD-10 code M10.*, chronic nontophaceous gout (M1A.***) and tophaceous gout (M1A.***) and uncontrolled gout (M10.*, M1A.*), the latter manifested by three gout codes (any) in the primary diagnosis position and three urate measurements within the same calendar year. Particular attention was placed on Emergency Room (ER) visits by individuals in each category and by individuals who had been evaluated by a rheumatologist.

Results: We identified 284,877 gout patients. The median age was 59.2 years and 79.0% were male. Of the 230,998 persons coded as acute gout, 10.7% were seen by a rheumatologist, whereas 26.9% of the 32,942 coded as chronic nontophaceous gout, 47.2% of the 7,723 coded as tophaceous gout and 43.6% of the 13,514 coded as uncontrolled gout were seen by a rheumatologist. In each gout category, the frequency of ER visits was significantly reduced in persons who had been seen by a rheumatologist (Table 1). In acute gout, the frequencies of ER visits in those with and without rheumatologist care were 5.6% vs 6.6% (p<0.001), respectively. In chronic nontophaceous gout it was 5.5% vs 6.7% (p=0.001); in tophaceous gout it was 10.3% vs 14.7% (p<0.001); and in uncontrolled gout it was 12.8% vs 19.0%, respectively. If the frequencies of rheumatologist-associated gout patient ER visits were applied to all gout subjects, there would have been 3,088 less ER visits in this cohort of gout patients.

Table 1.

Population	Overall N	Rheumatology Breakdown			Emergency Room Visits		
		W/ Rheumatology	Patients	%	With Gout ER Visit (%)	p-value (comparing %)	ER Visits* Per Patient
Acute Gout	230,698	Yes No	24,638 206,060	10.68% 89.32%	1373 (5.57%) 13632 (6.62%)	<0.001	1.47 1.53
Non-Tophaceous	32,942	Yes No	8,863 24,079	26.90% 73.10%	486 (5.48%) 1601 (6.65%)	<0.001	1.95 2.39
Chronic Tophaceous	7,723	Yes No	3,648 4,075	47.24% 52.76%	376 (10.31%) 597 (14.65%)	<0.001	2.78 2.89
Uncontrolled	13,514	Yes No	5,886 7,628	43.55% 56.45%	753 (12.79%) 1452 (19.04%)	<0.001	2.06 2.56

* ER Visits are only included in this analysis if the primary diagnosis code on the claim is a gout code (M10.X, M1A.X)

Conclusion: There appears to be a positive impact of rheumatologist involvement in the care of gout patients, manifested by a significant decrease in the frequency of ER visits. Considering the inconvenience and cost of ER visits, rheumatologist care may have a significant impact on the well-being of gout patients and on the overall cost of their care.

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AB1174

TRACKING THE EFFECTS ON A CLINICAL SERVICE OF INTRODUCING ULTRASOUND FOR DIAGNOSIS OF GIANT CELL ARTERITIS: DESIGN OF A SERVICE EVALUATION USING LEAN METHODOLOGY

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Background: In our large, multi-site hospital, patients with suspected GCA are started promptly on high-dose prednisolone but until 2019, patients waited for temporal artery biopsy (TAB) until the GCA diagnosis could be confirmed ("GCA") or refuted ("not-GCA"). Reports of the impact of introducing temporal and axillary artery ultrasound (TAUS) have mainly come from smaller hospitals. Agreement between TAUS and TAB has been reported by others with a Cohen's kappa of 0.35 [1] and 0.40 [2]. We used Lean methodology to identify metrics across 5 key domains: delivery, quality, service, morale and cost.

Objectives: To design metrics for a service evaluation to measure impact of introducing TAUS, and to test their feasibility of measurement within routine care.

Methods: Our primary driver was time from presenting to our service to diagnostic confirmation (lead time). Pathway mapping, value stream mapping and a driver diagram identified key ideas for improvement.

We chose to measure: Delivery (mean lead time for each month), Quality (proportion of patients with GCA and positive TAB/TAUS; total (cumulative) prednisolone dose in patients with not-GCA, Service (patient feedback), Morale (staff feedback) and Cost (number of patients; cost of tests per patient; overall costs). We plotted these by month on run charts and defined a significant shift as 6 consecutive monthly values below baseline median. Cohen's kappa was calculated using GraphPad QuickCalcs.

Results: Routine TAUS for suspected GCA was introduced from January 2019, alongside a multidisciplinary team monthly meeting. TAUS was done a median