Conclusions: Persistence appears to be a driver of cost-effectiveness of SC-TNFi treatment in patients with AS, especially when a societal perspective is taken. Therefore, prescribing the SC-TNFi with the best persistence may be a cost-effective strategy.

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Disclosure of Interest: M. Ivergård Employee of: Mapi, J. Dalén Employee of: Mapi, A. Svedbom Employee of: Mapi, C. Black Shareholder of: Merck & Co., Inc., Employee of: Merck & Co., Inc., R. Borse Shareholder of: Merck & Co., Inc., Employee of: Merck & Co., Inc., S. Kachroo Shareholder of: Merck & Co., Inc., Employee of: Merck & Co., Inc.

DOI: 10.1136/annrheumdis-2018-eular.2100

FRI0637 BARRIERS TO REMAIN IN WORK: RESULTS FROM THE NATIONAL RHEUMATOID ARTHRITIS SOCIETY SURVEY (NRAS)

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Background: Problems at work and work loss are still major socio-economic consequences for patients with Rheumatoid Arthritis (RA), employers and the society. Currently, there is a lack of understanding what the main barriers and facilitators are to remain in paid work. For patients and employers identifying these barriers and facilitators will enable them to make the right adjustments at a personal level. For policy makers these factors can determine future policies, aiming to reduce the overall socio-economic burden of RA.

Objectives: i) To understand reasons for work loss in people with RA; and ii) to compare problems at work in employed RA patients and those who had to stop working due to RA.

Methods: An online survey about employment was sent to UK NRAS members and distributed to non-members via social media including questions about problems at work in those employed or problems related to work in those who had to stop working or retire early due to RA. Rates of problems related to work were compared using Chi2 tests.

Results: 891 patients who completed the survey were in paid employment and 189 had stopped working due to RA or retired early due to their RA. Median [IQR] symptom duration was 12.5 [7.5–23.2] years and the majority were women (91%). Main reasons for leaving work included (patients could tick all that applied): unable to carry out duties (73%); time off sick (46%); fatigue (74%); problems with colleagues (12%); need for specific adaptations (11%); unable to travel to work (13%); lack of family support (3%); lack of support from employer (33%); and side effects of medication (24%). The majority of patients left their job >5 years earlier

than they had expected (72%) and 62/172 (36%) mentioned that their employer had not been helpful in assisting them to stay in work. For those in employment, the main challenges to remain in work were: demanding role; RA symptoms; no reasonable adjustments; commuting to work; and lack of understanding. Compared to patients in employment at time of survey, those who had to stop work due to their arthritis, reported having significantly serious problems regarding commuting to work, lack of understanding employers/colleagues, time off due to flare or medical appointments, health and safety and reluctance to make adjustments in their last job (table 1). Lack of family support was not significantly significant.

	not at all serious/ not very serious		neither serious nor non-serious		serious / very serious		P
	Employed	Stopped working due to arthritis	Employed	Stopped working due to arthritis	Employed	Stopped working due to arthritis	
Getting to and from work	326/609 (53%)	58/166 (35%)	136/609 (22%)	36/166 (22%)	147/609 (24%)	72/166 (43%)	<0.001
Lack of understanding from colleagues	300/603 (50%)	38/159 (24%)	129/603 (21%)	42/159 (26%)	174/603 (29%)	79/125 (50%)	<0.001
Health and Safety issues	303/594 (51%)	56/161 (35%)	170/594 (29%)	41/161 (25%)	121/594 (20%)	64/161 (40%)	<0.001
Time of medical appointments	362/624 (58%)	62/167 (37%)	108/624 (17%)	39/167 (23%)	154/624 (25%)	66/167 (40%)	<0.001
Lack of family support	378/617 (61%)	93/147 (63%)	111/617 (18%)	29/147 (20%)	128/617 (21%)	25/147 (17%)	0.577
Time off when having a flare or unwell	245/603 (41%)	29/165 (18%)	107/603 (18%)	17/165 (10%)	251/603 (42%)	119/165 (72%)	<0.001
Employer reluctant to make adjustments	282/538 (52%)	38/151 (25%)	134/538 (25%)	35/151 (23%)	122/538 (23%)	78/151 (52%)	<0.001
Lack of understanding employer	281/573 (49%)	36/156 (23%)	118/573 (21%)	27/156 (17%)	174/573 (30%)	93/156 (60%)	<0.001

Conclusions: Barriers to remain in work with RA are multi-factorial and related to the disease, nature of the work and understanding from employers and colleagues. Increasing understanding about RA amongst employers and colleagues in addition to often simple work adjustments, such as adaptations in the workplace and the opportunity to work more flexible, can prevent problems at work and work loss in the long-term and reduce the socio-economic burden.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.5393

FRI0638 A NOVEL GROUP CLINIC MODEL FOR NEW PATIENTS ENHANCES PATIENT ACTIVATION

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Background: Group clinics are a widely used, key alternative care model in USA (as shared medical appointments and other labels), especially in centres of excellence like the Cleveland Clinic. They are increasingly seen as 'a transformative innovation'¹ and recognised as an effective solution to the universal health-care challenges: increasing demand and limited resource². We have extensive experience of follow up group clinics for inflammatory arthritis patients since 2008 with a co-designed model integrating patient and team views³. Qualitative research showed robust themes associated with successful delivery: Efficiency, Empathy, Education, Engagement and Empowerment. 'Patient activation' describes the knowledge, skills and confidence a person has in managing their own healthcare, but there is no published data in group clinics. A group model has also never been used for seeing new patients in secondary care, so this is an original application of an established care model.

Objectives: To show feasibility for new patients seen in a group setting and assess patient experience, including activation.

Methods: A mixed methods pilot study. New patients awaiting Rheumatology appointments were invited to pilots at one of two hospitals: 1) with experience of group clinics 2) without. Patients agreeing to attend knew this was a new application of an established innovation with an option to stay for a focus group or be interviewed by telephone afterwards. Sessions were videoed for educational purposes and qualitative interviews were conducted under existing research approvals with relevant consents for both. Numerical data included Patient Activation Measure before/after the two-hour clinic, EQ-5D and a standard feedback tool. Qualitative data was analysed using nVivo and compared to previously identified themes.

Results: 19 patients were seen in two two-hour clinics (mean 13 mins/patient vs. 30 mins/patient usual care), including complex patients with multiple diagnoses. 69 patients were phoned, of whom 16 did not answer, 20 declined, 6 failed to attend, 3 declined to see a Rheumatologist at all, 2 were deemed not suitable and 3 already had an appointment. Feedback was very positive: median 10 (IQR 8–10) across all domains, so was consistent with usual clinics and follow up group clinics. Free text positive comments far outweighing the negative. EQ-5D showed a highly impacted group (mean global health index 54 vs. UK age norm 77). Patient Activation Measure showed significant improvement over each two-hour

session: (54–63 & 67–74; $p < 0.03$). Qualitative analysis mapped to previous themes will be summarised at the meeting.

Conclusions: It is feasible and effective to see new patients in a group setting with an experienced team. New patients group clinics have a powerful effect in empowering patients and may become an important option for hard to manage patients especially where resources are limited.

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Acknowledgements: Patients and team involved in this innovation.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.2844

FRI0639 THE IMPACT OF DISEASE ACTIVITY AND PAIN LEVEL ON PRODUCTIVITY IN RHEUMATOID ARTHRITIS (RA) PATIENTS

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Background: Rheumatoid arthritis (RA) is a disabling and progressive chronic autoimmune disease with associated burden in terms of work disability.

Objectives: To investigate the impact that RA associated pain and disease activity have on the level of work impairment patients experience, using data from the Burden of Rheumatoid Arthritis across Europe: a Socioeconomic Survey (BRASS).

Methods: Data were extracted from BRASS, a societal perspective observational RA dataset across 10 European countries (EU5, Denmark, Sweden, Hungary, Poland and Romania). 476 RA specialising clinicians provided information on 4,079 adult patients; of these, 2,087 patients completed corresponding questionnaires about the burden of RA. 646 patients were included in the analysis, having completed a patient questionnaire and with the physician having provided a DAS28-CRP score.

Descriptive analysis was used to explore the association between pain level, disease activity and productivity impairment due to RA. Summary measures were derived from BRASS data in which the Work Productivity and Activity Impairment Questionnaire was used to quantify impairment caused by the patient's RA, taking into account not only the proportion of time the patient is absent, but also the impact on their ability to perform their job. The relationship between disease severity (as measured by DAS28-CRP score), pain level (measured across 4 categories from 'no pain', 'mild', 'moderate' to 'severe pain') and overall work impairment was further explored using a generalised linear model where pain level and severity were modelled as explanatory variables against the overall work impairment outcome, while adjusting for covariates including age, gender and BMI.

Results: Of the 646 included in the analysis, average age was 54.6(14.1) years; mean (standard deviation), average DAS28-CRP score was 3.1(1.2), and average disease duration was 7(10) years; median (interquartile range). Descriptive analysis indicated that with greater levels of pain and/or disease activity, patients suffered increased levels of both work and activity impairment. The average marginal effect of covariates was calculated from regression outputs. Both pain level and DAS28-CRP score independently had a statistically significant association with work impairment; a unit increase in DAS28 score meant an increase in work impairment of 4.7% ($p=0.011$), whereas existence of 'mild', 'moderate' or 'severe pain' versus 'no pain' increased impairment by 33.3%, 43.4% and 45.0% respectively ($p < 0.05$), with confounders age, gender, BMI and either DAS28-CRP or pain level held constant.

Conclusions: Results from this large, multinational survey in Europe show that subjective domains of the disease, such as pain, could be as important as objective measures of RA activity in affecting a patient's ability to work; analysis suggested both pain and severity independently have a significant impact on work and activity impairment due to RA.

Disclosure of Interest: J. Galloway Consultant for: Receiving honorarium for speaking from Pfizer, UCB, Celgene and BMS, J.-P. Capron Employee of: Eli Lilly & Company, F. De Leonardi Shareholder of: Eli Lilly & Company, Employee of: Eli Lilly & Company, W. Fakhouri Employee of: Eli Lilly & Company, T. Burke: None declared

DOI: 10.1136/annrheumdis-2018-eular.3648

FRIDAY, 15 JUNE 2018

Validation of outcome measures and biomarkers

FRI0640 AUTOANTIBODIES TO TWO NOVEL PEPTIDES IN SERONEGATIVE AND EARLY RHEUMATOID ARTHRITIS IN THREE LARGE INDEPENDENT COHORTS

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Background: Despite recent progress in biomarker discovery for RA diagnostics, still over one third of RA patients are seronegative for RF and ACPA, a number which is even higher in early disease. In both the University of Hasselt (UH) cohort ($n=292$) and Leiden Early Arthritis Clinic (EAC) cohort ($n=600$), 38% of RA patients were seronegative for RF and ACPA. Testing for novel autoantibodies to UH peptides UH-RA.1 and UH-RA.21, reduced the serological gap from 38% to 29% in the UH cohort ($P=0.03$) and from 38% to 32% in the EAC cohort ($P=0.01$), with associated specificities in rheumatic controls ranging from 88–96%¹.

Objectives: Our aim is to validate the reactivities of autoantibodies against UH-RA.1 and UH-RA.21 peptides in early and seronegative RA patients from the CareRA cohort.

Methods: Peptide enzyme-linked immunosorbent assays have been developed to screen for the presence of antibodies to UH-RA peptides. Cut-off for seropositivity was defined by $2 \times$ SD above the mean antibody level of the healthy control group¹. Antibody reactivity to UH-RA.1 and UH-RA.21 was evaluated in baseline samples, collected before the start of treatment, of 223 early RA patients from the CareRA cohort.

Results: Antibodies to UH-RA.1 and UH-RA.21 were found in respectively 5% and 21% of the baseline samples from the CareRA cohort. These antibodies were found in similar levels in both RF/ACPA seropositive and seronegative patients. In the CareRA cohort, 24% of patients were seronegative for RF and ACPA and combining the presence of autoantibodies to UH-RA.1 and UH-RA.21 with RF/ACPA serology, reduced the seronegative population from 24% to 18% ($P=0.13$).

Conclusions: Screening for antibodies against novel UH peptides UH-RA.1 and UH-RA.21 has now been performed in three large independent cohorts. This study validates the presence of antibody reactivity to these UH-RA peptides in seronegative and early RA. This might reinforce current diagnostics and improve early diagnosis and intervention in RA.

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Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.6315

FRI0641 DETECTION OF CHANGES IN SLE DISEASE ACTIVITY IS HIGHLY IMPROVED WITH SLE-DAS AS COMPARED TO SLEDAI: DERIVATION AND PRELIMINARY VALIDATION OF THE SLE DISEASE ACTIVITY SCORE (SLE-DAS)

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Background: SLEDAI is a widely used instrument to measure disease activity of systemic lupus erythematosus (SLE). However, it lacks sensitivity to discriminate improvement/worsening as it only scores items categorically and does not include several relevant lupus features, such as hemolytic anemia.

Objectives: To derive and validate a SLE Disease Activity Score (SLE-DAS) with improved sensitivity to change, while maintaining the high specificity and simplicity of use of the SLEDAI.

Methods: 324 patients fulfilling ACR'97 and/or SLICC'12 classification criteria for SLE and regularly followed at a tertiary care lupus clinic from January 2014 to December 2017 were included. At each outpatient visit, clinical and laboratory data were collected and disease activity (last 30 days) was scored with Physician Global Assessment (PGA) (0–3 scale) and SLEDAI-2K. To derive the SLE-DAS