baseline]. In comparison with baseline the change in the Solomon's score did not reach the statistical significance [10.68 (95%CI 8.78–12.58); $p=0.66$]. In 38 (39.2%) patients that achieved persistent CDAI remission/low disease activity during the entire 5 years follow-up we observed a statistically significant reduction in the Cuore project score [4.1 (95%CI 2.1–6) vs 3.8 (95%CI 2.3–5.3); $p=0.02$] and in the Solomon's score [9.3 (95%CI 5.6–13) vs 7.8 (95%CI 5.2–10.5); $p=0.04$]. No statistical significance was found in CV risk scores stratifying patients for disease duration, RA specific disease characteristics, and mechanism of action and/or number of switch in bDMARD treatment.

Conclusions: RA patients are at moderate/high CV risk as assessed by the different CV risk scores used, more consistent if inflammatory or disease specific items are considered in the score. Sustained CDAI remission obtained with bDMARDs can invert CV risk progression for 5 years estimated by Cuore project and Solomon's score, despite ageing.

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THU0154 A PROGRAM FOR SCREENING AND TREATMENT OF CARDIOVASCULAR RISK FACTORS IN PATIENTS WITH CHRONIC ARTHRITIS: 2-YEAR RESULTS

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Objectives: Assess the efficacy of a program for the screening and management of cardiovascular risk factors (CVRF) in patients with chronic arthritis at 2 year follow-up.

Methods: Longitudinal and prospective study of patients included in a program aimed at the screening and improvement of the management of CVRF. Patients diagnosed with rheumatoid arthritis (RA), spondyloarthritis (SpA) and psoriatic arthritis (PsA) were included in the program. In the baseline and follow-up visits, CVRF were recorded, as was their treatment and whether treatment targets were achieved. SCORE index was calculated and modified according to EULAR 2010 recommendations. Tailored education was performed by the nurse and (if needed) referral to the rheumatologist or GP was performed for CVRF drug treatment. For this analysis, we selected patients who completed baseline assessment and the 2 year follow-up. Prevalence and degree of control of CVRF were compared at both time points.

Results: Out of a total of 416 patients included in the program, 123 have completed both the baseline visit and the 2 year follow-up: 79 (64%) women with a mean age of 59.3 ± 10 years. Patients with RA ($n=85$), SpA ($n=14$) and PsA ($n=24$) were included.

	BASELINE		2 YEAR FOLLOW UP	
	N (%)	Poor control N (%)	N (%)	Poor control N (%)
DM	14 (11%)	4 (3%)	14 (11%)	4 (3%)
Hypertension	77 (63%)	54 (44%)	84 (68%)	42 (34%)
Hypercholesterolemia (CT>220 mg/dL)	66 (54%)	37 (31%)	83 (67%)	20 (16%)*
Smoker	28 (23%)	—	20 (16%)	—
Obesity (BMI>30)	47 (38%)	—	45 (37%)	—
CV events	6 (5%)	—	6 (5%)	—

* $p<0.05$ comparison baseline – 2 year follow-up

The mean modified SCORE index was 4.6 ± 4 at baseline and 4.6 ± 4 at follow-up. Risk stratification (according to European guidelines) was 73 patients with intermediate risk, 20 with high risk and 20 with very high risk. Meanwhile, at 2 year follow-up, 74 patients showed an intermediate risk, 25 a high risk and 19 a very high risk.

Conclusions: A specific program aimed at detecting CVRF increases the proportion of patients with a CVRF diagnosis. However, it is also associated with an

increase rate of well-controlled hypercholesterolemic patients, with a trend observed in hypertensive patients and smokers. In case the improvement in CVRF control is confirmed, programs such as this could improve the CV prognosis of patients with chronic arthritis.

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THU0155 CUSTOMISED CONSTRUCTION OF DEVICES AS INTEGRATION OF OCCUPATIONAL THERAPY INTERVENTION IN RHEUMATOLOGY BY 3D PRINTING TECHNOLOGY AND CO-DESIGN: FURTHER DEVELOPMENT AND VERIFICATION OF LONG-TERM EFFECTIVENESS

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Background: In our previous study¹ we have analysed the potentiality to create customised personalised aids through the 3D printing technique for patients with chronic physically and psycho-socially progressively disabling rheumatic diseases. It has been shown that the active involvement of the patient in the aid prototyping process through co-design sessions allows a greater acceptance of the aid itself in daily activities.

Objectives: To confirm the effectiveness of custom co-designed aids made with 3D printing technique. To check long-term patient's satisfaction in their daily use. To demonstrate that a client-centred intervention leads to aids greater acceptance, reduces social stigma and improves self-esteem.

Methods: 9 patients affected by long term rheumatoid arthritis were enrolled overall. They expressed their specific needs regarding the aid devices and therefore subsequent meetings were organised that have allowed us to produce and deliver customised objects.

Tools: Autodesk Fusion360 and Dassault Systemes SolidWorks for object modelling; Ultimaker Care for slicing; 3D printing DeltaWASP 20 40

Following a co-design approach, 6 aid devices were customised: hand grip holder for chalk, tablespoon, aid to open the moka coffee machine (2 different models), cans opener, zip puller. For the collection of the design features the product analysis of the USERfit tool was used. The psycho-social impact assessment of the assistance by PIADS (Psychosocial Impact of Assistive Devices Scale) and the patient's satisfaction by QUEST (Quebec User Evaluation of Satisfaction with Technical Aids, scale 1–5) were analysed after 1 week and after 1 year

Results: After 1 year all co-designed aids are still in use and the patients' satisfaction remains unchanged. The psychosocial assessment of delivered aid devices, collected through PIADS (– scale –3+3), showed an overall positive outcome (mean competence +1.92; adaptability: +1.590; self-esteem: +1.70). The assessment of patient satisfaction through QUEST, was good (scale 1–5: satisfaction aid: 4.65; service satisfaction: 4.9). There are no significant changes between scores after 1 week and 1 year except for a reduction in the self-esteem score ($p=0.006$)

Conclusions: This work shows that an interactive co-design, made possible by 3D printing, allows patients with long-established strategies in the activities of daily life to change habits, satisfactorily. The decrease of self-esteem scores could be probably due to a lower patient's emotional involvement with respect to an object that has become a regular part of his life.

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THU0156 DEPRESSION AMELIORATED BY ORTHOPAEDIC SURGICAL INTERVENTION IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Depression is the most frequently seen comorbidity in the patients with rheumatoid arthritis (RA) ¹. Inflammatory mediators, including TNF- α ,

interleukin-1 and interleukin-6, affect serotonin transporters in the brain and promote low stress tolerance and depression².

Objectives: To investigate the effect of orthopaedic surgery on the mental condition of patients with RA by assessing the Beck depression inventory II (BDI-II) and to investigate the factors associated with changes in the BDI-II.

Methods: A prospective cohort study was performed in 294 sites of primary elective surgery in 276 patients with structural damage due to RA. The average (range) age was 64^{19–89} years old, and the average (range) disease duration was 16^{1–60} years. The surgical site was the shoulder in 6 patients, elbow in 26, wrist in 74, hand in 63 (with wrist in 18), hip in 13, knee in 50, ankle in 12, and forefoot in 50. The BDI-II, EuroQol 5 dimensions (EQ-5D), Japanese version of the Stanford Health Assessment Questionnaire (J-HAQ), and disease activity score 28 using C-reactive protein⁴ (DAS28-CRP⁴) were assessed at the baseline and at 12 months after surgery. During the observational period, the number of patients using methotrexate (MTX), prednisolone (PSL), and biological disease-modifying anti-rheumatic drugs (bDMARDs) did not change significantly. The mean dose of MTX and PSL was reduced by 0.4 mg/w and 0.2 mg/d, respectively, at 12 months after surgery.

Results: In total, the mean BDI-II significantly improved from 13.0 to 11.5 at 12 months after surgery ($p<0.01$). The number of patients with depression (BDI-II ≥ 14) decreased from 42.8% to 34.8% (figure 1). A significant improvement in the BDI-II was noted in the elbow, wrist, hand, and forefoot surgeries ($p<0.05$). EQ-5D, J-HAQ, and DAS28-CRP⁴ also improved significantly ($p<0.01$)³. A multiple regression analysis showed that the magnitude of decrease in the BDI-II (Δ BDI-II) was independently related to the Steinbrocker's stage (95% confidence interval [CI]: 0.42, 2.39, $p=0.005$) and pain-visual analogue scale (VAS) (95% CI: 0.01, 0.10, $p=0.02$) at baseline and inversely related to matrix metalloproteinase-3 (MMP-3) (95% CI: -0.01 , -0.001 , $p=0.03$) at baseline. The BDI-II was correlated with the EQ-5D ($\gamma=-0.049$, $p<0.01$) and J-HAQ ($\gamma=0.387$, $p<0.01$) at 12 months after surgery.

Abstract THU0156 – Figure 1. Distribution of BDI-II at baseline and a postop. 12mos.

Conclusions: Depression was ameliorated by surgical intervention in patients with RA. The mental condition is associated with the quality of life and physical function.

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THU0157 ALTERED DNA-METHYLATION IN CHILDREN BORN TO MOTHERS WITH RHEUMATOID ARTHRITIS DURING PREGNANCY

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Background: Exposures during early life are associated with later-life health, which is referred to as the Developmental Origins of Health and Disease hypothesis¹. Epigenetic processes are thought to be one of the mechanisms underlying this hypothesis. DNA-methylation is the best studied and understood epigenetic modification. DNA-methylation of the fetus *in utero* may be influenced by multiple factors, including maternal disease².

Objectives: To determine whether the DNA-methylation profile of children born to women with RA is different from children born to women from the general

population. Furthermore to determine which pathways are associated with the significantly differentially methylated CpG sites.

Methods: For the current study, blood from 80 children with a mean age of 6.82 (SD=1.28) born to women with RA, who were followed prospectively during pregnancy and postpartum in the PARA-study³, was used to measure genome-wide DNA-methylation using the Infinium Illumina Human-Methylation 450 k BeadChip. DNA from 345 children with a mean age of 6.04 (SD=0.39) born to women from the population-based Generation R study⁴ were used as controls, also followed prospectively during pregnancy and postpartum. Linear mixed models were used to analyse differences in methylation between these groups. The models were corrected for age, BMI (SDS) and sex of the child, gestational age at delivery, maternal age, folic acid use during pregnancy, socioeconomic status, maternal smoking during pregnancy, white blood cell subtypes and technical batch.

Results: In total 770 CpGs were significantly different between the 2 groups at Bonferroni threshold $p=1.08 \times 10^{-7}$ (see table 1. for top 10 sites). In addition, pathway analysis resulted in 4 statistically significant enriched pathways. The top 2 pathways were the FOXO signalling pathway consisting of 16 genes ($p=3.39 \times 10^{-4}$) and mTOR signalling pathway consisting of 17 genes ($p=5.65 \times 10^{-4}$). These pathways are known for regulating the glucose and lipid metabolism, respectively.

Table 1 Top 10 methylation sites from the linear mixed model

CpG	P-value	Beta	SE	Nearby gene ($\pm$ bp)	Chr	Bp	Location*
(Effect size)							
cg07786668	4.75*10 ⁻³³	0.027	0.002	ZFXH3(-10142)	16	73092391	-
cg06642177	1.29*10 ⁻²⁹	0.028	0.002	SLC2A12(-122529)	6	134496341	-
				SGK1(+142878)			
cg08867893	5.68*10 ⁻²⁷	0.017	0.001	ZNF365(+221)	10	64134160	-
cg20116574	4.89*10 ⁻²³	0.024	0.002	NCOA5(+435)	20	44718168	Promoter
cg06778273	9.33*10 ⁻²³	0.021	0.002	TNFRSF18(+4995)	1	1137117	-
				TTL10(+27808)			
cg21160472	8.45*10 ⁻²²	0.015	0.001	ATF3(+119)	1	212782112	Promoter
cg01067849	4.09*10 ⁻²⁰	0.011	0.001	WRNIP1(-102)	6	2765587	Promoter
cg06656994	5.88*10 ⁻¹⁹	0.051	0.005	FAM163A(+903)	1	179713176	Enhancer
cg14810343	1.36*10 ⁻¹⁸	0.013	0.001	CXXC5(-127)	5	139028149	-
cg01458961	3.47*10 ⁻¹⁸	0.032	0.003	PPP3CA(-822)	4	102269425	-

* Location in promoter, gene, enhancer or other/unknown (-)

SE= standard error; bp=base pair; Chr= chromosome

Conclusions: This study demonstrates that children born to women with RA have a different methylation profile compared with children born to mothers from the general population.

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THU0158 INCREASED PROGRESSION OF ATHEROSCLEROSIS IN PATIENTS WITH RHEUMATOID ARTHRITIS IS PARTIALLY REFLECTED BY DISEASE SEVERITY AT THE TIME OF DIAGNOSIS- 11-YEAR PROSPECTIVE FOLLOW-UP

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Background: Patients with Rheumatoid arthritis (RA) have increased mortality and morbidity due to cardiovascular disease (CVD) compared to general population. While it has been established that atherosclerosis is increased, there is much yet to reveal about the underlying cause. Contributing factors, such as