Methods: Individual patient-level variables were obtained from a single institution TKR and THR registry between 5/1/07 and 2/1/11. Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain and function scores at baseline and 2 years after elective TKR and THR were collected and retrospectively analysed. We included patients living in New York, Connecticut and New Jersey which is the catchment area for the hospital. Individuals' geocodable addresses were used to obtain the number of primary care physicians (PCPs) and specialists in each census tract using the ArcGIS software. Provider density was calculated and broken down into percentage quartiles. Comparisons were made using Kruskal-Wallis tests.

Results: A total of 3606 TKR, and 4295 THR patients were included. (figure 1) Mean number of PCPs were 5.4(SD 9.5) and specialists were 15.8(SD 41.1) per census tract. The median number of PCPs were 2 (IQR 1, 6) and specialists were 3 (IQR 1, 13). Neighbourhood poverty or education correlated poorly with the number of PCPs and specialists. Baseline WOMAC pain and function scores (table 1) are statistically significantly better in neighbourhoods with a higher proportion of specialists, but not PCPs. These differences were no longer present 2 years after surgery.

Abstract OP0338 – Table 1 Association of specialist proportions in neighbourhoods with WOMAC* scores

	Proportion of Specialists per census tract	Baseline WOMAC* median [IQR]	p-value	2-year WOMAC* median [IQR]	p-value	Baseline WOMAC* median [IQR]	p-value	2-year WOMAC* median [IQR]	p-value
Pain									
	Total Hip Replacement					Total Knee Replacement			
Quartile 1 (Lowest)	50 [40,65]		<0.001	100 [90,100]	0.59	50 [40,65]		95 [80,100]	0.76
Quartile 2	50 [40,65]			100 [90,100]		55 [40,65]		95 [80,100]	
Quartile 3	55 [45,65]			100 [90,100]		55 [45,65]		95 [85,100]	
Quartile 4 (Highest)	55 [45,65]			100 [90,100]		56.3 [45,70]		95 [80,100]	
Function									
	Total Hip Replacement					Total Knee Replacement			
Quartile 1 (Lowest)	46.9 [35.3,58.8]		<0.001	95.6 [86.8,100.0]	0.49	50.0 [39.7,61.8]		91.2 [75.0,98.4]	0.37
Quartile 2	48.3 [36.8,61.8]			95.6 [86.8,100.0]		52.9 [42.7,66.2]		90.6 [76.5,97.1]	
Quartile 3	50.0 [39.7,64.7]			96.9 [88.2,100.0]		52.9 [42.7,66.2]		89.9 [77.9,97.1]	
Quartile 4 (Highest)	50.0 [39.4,63.3]			96.9 [88.2,100.0]		55.9 [44.1,69.1]		91.2 [78.3,98.5]	

*WOMAC - Western Ontario and McMaster Universities Osteoarthritis Index

Abstract OP0338 – Figure 1 Map of New York, New Jersey and Connecticut with census tract specialist provider density and baseline WOMAC pain scores of individual patients.

Conclusions: Patients from neighbourhoods with fewer specialists seek arthroplasty with worse baseline pain and function than those from neighbourhoods with more specialists. However, once these patients receive arthroplasty (i.e. specialty care), these differences resolve by 2 years. These data suggest that once a patient can access specialty care in the health care system, their outcomes improve despite worse baseline pain and function.

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OP0339

DEVELOPMENT OF A PREDICTIVE MODEL OF RADIOLOGICAL DAMAGE IN PATIENTS WITH RHEUMATOID ARTHRITIS BASED ON ARTIFICIAL INTELLIGENCE

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Background: Rheumatoid arthritis (RA) is a chronic inflammatory disease associated with increased mortality and disability. Although different factors associated with prognosis have been identified, it is still difficult to predict the evolution of a specific patient.

Objectives: Our objective is to train and validate a predictive model of disease severity using radiological damage as a surrogate marker, based on Artificial Intelligence techniques, and using clinical and genetic data.

Methods: Four independent cohorts were included (892 patients with 1667 hand X-rays). Radiological damage was measured with the Sharp/van-der-Heijde score (SvdH). The variables to be predicted [total value of SvdH, erosion component (ES) and joint narrowing (NS)] were logarithmically transformed. As clinical predictors, age at onset of symptoms, sex, duration of the disease at the time of each radiograph, year of onset of symptoms and presence of rheumatoid factor were used. As genetic variables, the single nucleotide polymorphism data obtained from the Immunochip genotyping platform (Illumina) were used. In addition, an interaction between each polymorphism and the duration of the disease was introduced. Three cohorts were used for the selection of variables, generation of predictive models and internal validation. The fourth cohort was used to perform the external validation of the models. Regression trees with random effects were generated using the R package 'REEMtree'. The goodness of fit of the models was measured using the root mean squared error (RMSE) and the intraclass correlation coefficient (ICC).

Results: In the cohorts where the predictive models were developed, the RMSEs for total SvdH, ES and NS were 3.16, 1.02 and 2.29 units of the Sharp/van-der-Heijde score, respectively. The ICCs were 0.96, 0.87 and 0.95, respectively. In the external validation cohort, the RMSEs were 7.13, 3.53 and 4.81 units of the Sharp/van-der-Heijde score, respectively. The ICCs were 0.90, 0.78 and 0.88.

For the total SvdH, the best fit model contained the variables 'age of onset of the symptoms of RA' and the interaction between duration of the disease and 3 polymorphisms: rs10752907, rs4405161 and rs2501617. For the ES, it contained the variables 'age of onset of AR symptoms', the polymorphism rs7769752 and the interaction between disease duration and 6 polymorphisms: rs12410412, rs117029499, rs72925969, rs869186, rs11258464, rs4781952. For the NS, it contained the variables 'age of onset of AR symptoms', 'gender', and the interaction between disease duration and 9 polymorphisms: rs3814055, rs1020822, rs13157991, rs152294, rs2914190, rs10824537, rs2637229, rs114136906 and rs4958241.

Conclusions: It is possible to generate predictive models of radiological damage of great precision using Artificial Intelligence techniques. This could allow early stratification of patients according to prognosis.

It is necessary to validate these models in other populations.

Disclosure of Interest: None declared

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From big data to personalised medicine in paediatric rheumatic diseases

OP0340

EVIDENCE BASED RECOMMENDATIONS FOR CORTICOSTEROID TAPERING/DISCONTINUATION IN NEW ONSET JUVENILE DERMATOMYOSITIS PATIENTS FROM THE PRINTO TRIAL

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Background: At present no clear evidence based guidelines exist to standardise the tapering and discontinuation of corticosteroids (CS) in juvenile dermatomyositis (JDM).

Objectives: To provide evidence-based recommendations for CS tapering/discontinuation through the analysis of the patients in the PRINTO new onset JDM trial. Secondary objective of the study was to identify predictors of clinical remission and CS discontinuation.