scenarios and help them make more informed decisions as they seek to plan a sustainable, integrated OA care system.

Methods: The decision-support tool is based on a system dynamics (SD) simulation model of patient flow across the continuum of care, from self-directed, primary and specialist care, through surgical interventions, post-surgical follow-up and long-term revisions. This simulation model was developed using established principles of SD modeling and an iterative, integrated knowledge translation process which included multiple workshops with front-line clinicians and administrators aimed at defining the problem and system boundaries and documenting existing care processes. We then modeled the system as a series of stock and flows, populated, calibrated and validated with data extracted from several administrative health databases including physician claims (billing), hospital inpatient records, and ambulatory care data.

Results: The resulting SD model estimates the patient population stratified by demographic factors such as age and gender, their OA care resource requirements and the associated costs at each stage of care over a 20-year time horizon, taking into account regional variations in practice patterns. In the base case, the model demonstrates system behaviour and outcomes based on current practice, providing insight into flow, resource use and cost variations across patient populations and care settings, as well as the long-term implications of maintaining the status quo. For example, if current practices continue, the number of hip and knee joint replacement surgeries is estimated to increase by more than 5,000 per year between 2015 and 2035. By changing any of the numerous patient flow, stage duration, resource use and cost parameters included in the model, it can also be used to simulate various scenarios, enabling comparison of their outcomes. For example, in a scenario in which a 14 week surgical wait time is implemented in year 2015, the results show that the number of surgeries that must be performed dramatically increases by almost 600 in the first year due to the need to "catch-up" on the existing surgical queue. However, this spike is short-lived and surgery rates in the long-term are similar to those which would have been required without the wait time target. Furthermore, the costs of performing the additional surgeries required to maintain the target are increasingly offset by the savings achieved by lower demand for care among patients waiting for surgery due to their shortened wait time.

Conclusions: Our SD model can be used as a decision-support tool to estimate changes in health care demands, resource requirements and costs over time and as a result of implementing various OA management scenarios. Furthermore, these results can help policy makers to make informed decisions when planning a sustainable OA care system.
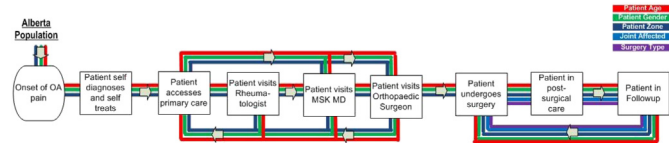
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PROGRESSION OF DISABILITY IS ASSOCIATED WITH SOCIOECONOMIC MEASURES IN THE JOHNSTON COUNTY OSTEOARTHRITIS PROJECT

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Purpose: Few studies have investigated whether socioeconomic status (SES) is associated with an increase in disability among individuals with knee and/or hip osteoarthritis (OA). We sought to explore whether SES measures at baseline were associated with progression of disability at follow-up in the Johnston County Osteoarthritis Project (JoCo OA).

Methods: Analyses were carried out using baseline SES measures for individuals with knee and/or hip OA aged 45 or older who entered the cohort during the original study enrollment (1990–1997) and disability progression of individuals who returned at first follow-up (FU; 1999–2003). SES measures included education (no high school diploma [HS] vs. HS diploma or more), homeownership (none vs. own home), occupation (non-professional vs. professional), annual household income (<$30,000 vs. ≥$30,000) and block group poverty (≥20% vs. <20%). Disability progression was assessed using the self-reported Health Assessment Questionnaire (HAQ) Disability Index score, where an increase of ≥0.2 in the HAQ score was considered progression. Odds ratios (OR) and 95% confidence intervals (CI) for the association between SES and disability progression were estimated using logistic regression simultaneously adjusting for other SES measures plus age, gender, hip and knee injury, BMI and smoking.

Results: There were 600 individuals with knee and/or hip OA from the baseline enrollment who returned at FU, with a mean follow-up of 6.1 years. The mean age was 64.0 years, 62.7% were female, 28.0% African American, and mean BMI was 29.5 kg/m2.. At first FU, there was increased disability in 42.2% of individuals with knee OA and 35.5% of individuals with hip OA. In analyses which included individuals with knee and/or hip OA, when compared with those who had a HS education or more, those with less than a HS education had developed more disability at FU (OR = 1.86, 95% CI = 1.14–3.04) (Table 1). Similarly, individuals who did not own their home were more likely to have disability progression when compared with those who did own their home (OR = 1.62, 95% CI = 1.00–2.63), as were those who had a household income <$30k when compared with those who had an income of ≥$30k, although the association failed to reach statistical significance (OR = 1.62, 95% CI = 0.81–3.22). Most results were similar when evaluating the association between SES measures and disability progression among those with knee OA alone or hip OA alone. Exceptions being non-significantly elevated associations for disability progression with income <$30k and block group poverty ≥20% among those with hip OA alone, whereas no associations for these comparisons were observed among those with knee OA alone.

Conclusion: Our data show that individuals with lower education, who were non-homeowners or had lower income were more likely to have increased disability at first follow-up, associations that remained after adjustment for other SES measures. Our results suggest that SES may have an influence on increasing disability. These findings identify potential individual attributes that could aid clinicians in developing personalized OA management programs for their patients.

Table 1
Adjusted[†] odds ratios (OR) and 95% confidence intervals (CI) for the association between SES measures and an increase of ≥02 in the HAQ score at first follow-up

Baseline SES Measure	All individuals with Knee and/or Hip OA (n = 600) OR (95% CI)[‡]	Individuals with only Hip OA (n = 39) OR (95% CI)[§]	Individuals with only Knee OA (n = 277) OR (95% CI)[¥]
<HS Education	1.86 (1.14–3.04)	2.01 (1.14–3.53)	1.79 (0.88–3.67)
No Homeownership	1.62 (1.00–2.63)	1.65 (0.93–2.91)	1.61 (0.78–3.33)
Income <$30k	1.62 (0.81–3.22)	1.45 (0.69–3.08)	0.92 (0.35–2.44)
Non-Professional Occupation	0.88 (0.53–1.45)	0.84 (0.48–1.49)	0.99 (0.47–2.11)
Block Group Poverty >20%	1.35 (0.87–2.11)	1.57 (0.93–2.64)	1.02 (0.54–1.93)

[†]Mutually adjusted for race, education, home ownership, income, occupation, poverty
[‡]Additionally adjusted for age, gender, hip, & knee injury, BMI and smoking
[§]Additionally adjusted for age, gender, hip injury, BMI and smoking
[¥]Additionally adjusted for age, gender, knee injury, BMI and smoking

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ASSOCIATIONS BETWEEN SOCIOECONOMIC STATUS AND RADIOGRAPHIC AND SYMPTOMATIC KNEE OSTEOARTHRITIS IN THE OSTEOARTHRITIS INITIATIVE

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Purpose: There is growing evidence for socioeconomic disparities in the distribution of osteoarthritis (OA). Our study aims to evaluate the relationship between socioeconomic status (SES) and knee OA among participants in the osteoarthritis initiative (OAI).

Methods: The OAI is an open-access database of 4796 participants between the ages of 45 and 79. Knee radiographs were taken at enrollment and scored on the Kellgren-Lawrence (KL) scale. Participants with a KL grade greater than or equal to 2 were considered to have definite radiographic knee OA (R-kOA), further classified as symptomatic knee OA (S-kOA) in the presence of self-reported knee pain, swelling, aching or stiffness in that joint over the past 30 days. SES was determined using 6 levels of education and 5 categories of income,