

Methods: This cross-sectional study includes members of the Framingham Foot Study. A validated exam of the foot was used to assess the presence of hallux valgus, hallux rigidus, and plantar fasciitis. To determine foot type, center of pressure excursion index (CPEI) measurements were recorded using the TekScan Matscan (1.4 sensors/cm²) system. CPEI is a dynamic measure of foot type that uses the concavity of the center of pressure curve in the metatarsal head region, normalized to foot width during the stance phase of gait. In a prior study by Hillstrom et al., utilizing the emed-x plantar pressure system (4 sensors/cm²), CPEI thresholds discriminated planus, rectus (normal arch), and cavus (high arch) feet. Due to the differences in system resolution, a scaling equation was developed in order to determine the equivalent CPEI threshold on a TekScan Matscan system that differentiated planus from non-planus (rectus and cavus) feet. This threshold was defined as a CPEI ≤ 19.4% on a TekScan Matscan system. Crude and adjusted logistic regression models, using generalized estimating equations (GEE) to account for the correlation between left and right feet, were used to calculate odds ratios for the relation between foot type and the prevalence of hallux rigidus, hallux valgus, and plantar fasciitis. Adjusted models included age, sex and body mass index (BMI).

Results: This study included 2,994 participants (5,778 feet) with an age range of 36–98 years and 55% women. The results are shown in Table 1. Approximately 74% of the study population (mean age = 65.5 ± 9.9 years) was classified as having pes planus in at least one foot. Those with flat feet were at an increased odds for hallux valgus (OR 1.6, 95% CI 1.4, 1.8) and hallux rigidus (OR 1.6, 95% CI 1.1, 2.3). These results remained significant when adjusted for age, gender, and BMI.

Conclusions: Those with planus foot type had a higher odds of hallux valgus and hallux rigidus, but not plantar fasciitis. The high prevalence rate of pes planus in the Framingham cohort may be because the average participant is 66 years old and arch height has been shown to decrease with age. Further, CPEI recordings may be more sensitive to less severe cases of pes planus, contributing to this high prevalence rate. Hallux valgus and hallux rigidus was more prevalent in pes planus versus non-planus feet. This is important because foot structure and function are potentially modifiable factors for these pathologies that have implications for prevention and treatment.

Results from GEE logistic regression models assessing the odds of foot pathology.

	Hallux Valgus	Hallux Rigidus	Plantar Fasciitis
Prevalence (%)	49.6	5.9	6.6
Foot Type	n (%)	n (%)	n (%)
Planus (CPEI ≤ 19.4%)	29.1	3.6	3.2
Non-Planus (CPEI > 19.4%)	20.5	2.3	3.4
Bivariate Model (N = 5,781)	OR (95%CI)	OR (95%CI)	OR (95%CI)
Foot Type			
Planus (CPEI ≤ 19.4%)	1.6 (1.4–1.8)	1.6 (1.1–2.3)	0.97 (0.70–1.3)
Non-Planus (CPEI > 19.4%)	Ref	Ref	Ref
Multivariate Model (N = 5,781)*	Hallux Valgus OR (95%CI)	Hallux Rigidus OR (95%CI)	Plantar Fasciitis OR (95%CI)
Foot Type			
Planus (CPEI ≤ 19.4%)	1.2 (1.1–1.4)	1.5 (1.1–1.9)	0.89 (0.67–1.2)
Non-Planus (CPEI > 19.4%)	Ref	Ref	Ref

* Adjusted for age, gender, & BMI

317 SURVIVAL ON CONTROLLED-RELEASE MORPHINE VERSUS CONTROLLED-RELEASE OXYCODONE IN OPIOID-NAÏVE PATIENTS WITH NON-MALIGNANT PAIN: DATA FROM DANISH NATIONAL HEALTH REGISTERS

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Purpose: Opioids provide one treatment option for severe non-cancer pain. In osteoarthritis the benefits associated with the use of opioids are

presumably limited by frequent side effects, leading patients to withdraw, switch/rotate to another opioid. The aim of this study was to compare the risk of patients rotating opioid therapy from either controlled-release (CR) morphine or CR oxycodone in opioid-naïve patients with non-malignant pain.

Methods: By individual-level linkage of the Danish nationwide administrative registries between 2005–2007, adult patients who were prescribed either CR morphine or CR oxycodone, who had not previously been prescribed opioids (at least six months prior to “baseline” defined as the first prescription of CR morphine or CR oxycodone), were followed up for as long as 3 years (maximally until December 31, 2007). Patients with a cancer diagnosis were excluded from the study and subsequent analyses. Adjusted for age, sex, comorbidity, calendar year, concomitant pharmacotherapy, income and social status, Hazard Ratios (HR) for the association between opioid treatment (CR-oxycodone vs. CR-morphine) and withdrawal from opioid therapy were analyzed by Cox proportional-hazard models. The main outcome measure was the number of patients switching from one type of opioid to another; secondary outcome was the number of patients who were able to withdraw from opioid therapy (i.e., no further need for opioid analgesics).

Results: Of the 101,635 patients assessed for inclusion, 75,587 (74%) had been prescribed opioids 6 months prior to enrolment and 4,818 (5%) had a cancer diagnosis. In total, 21,230 patients were enrolled, 16,553 (78%) were prescribed CR-oxycodone and 4,677 (22%) CR-morphine. Of these, 5,750 (35%) CR-oxycodone patients and 2,166 (46%) CR-morphine patients switched to another opioid. After adjustment, CR-oxycodone was associated with a statistically significant reduced risk for rotation (switch) to another opioid compared to CR morphine; HR = 0.82 (95%CI: 0.78–0.87; P < 0.001). Among patients still on therapy at time of censoring (possible drug addiction development), 4.5% (112) were still using CR-morphine and 2.1% (231) were using CR-oxycodone.

Conclusion: This study demonstrates a significantly greater risk (18%) for opioid rotation using CR-morphine compared with CR-oxycodone in patients suffering from non-malignant pain.

318 SIMULATION MODELING WITH SYSTEM DYNAMICS (SD) TO PLAN OSTEOARTHRITIS CARE DELIVERY IN ALBERTA

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Purpose: Currently, there are no reliable and validated tools that health service decision-makers can use to inform system level policy decisions. To address this need, we worked with health administrators, clinicians and researchers to create and validate a decision-support tool that service planners can use to achieve a sustainable, integrated care system for hip and knee osteoarthritis (OA).

Methods: The tool is based on a system dynamics (SD) model of patient flow across the continuum of care, including self-directed, primary, rheumatologic and orthopaedic specialist, acute, and surgical follow-up care. The model was developed in four phases: phase 1 focused on demand and flow rates, phase 2 on resource use and costs, phase 3 on geographical stratification, and phase 4 on adding feedback loops. We populated the model with data from several sources, including Alberta Health & Wellness (e.g. physician claims, inpatient, and ambulatory data), Statistics Canada (e.g. the Survey of Living with Chronic Diseases in Canada and population projections), and the Alberta Bone and Joint Health Institute (clinical/surgical data). Using established principles of SD modeling and an iterative, integrated knowledge translation process involving multiple workshops with front-line clinical staff and administrators, we defined the problem, determined the care process, modeled the system as a series of stock and flows, tested, validated and calibrated the model.

Results: We have developed the full SD model, for two key applications. First, it can help identify flow, resource use and cost variations in current practice, which may benefit from further exploration. For example, variations in practice patterns, particularly surgery rates and resource use, were observed among the health zones reflecting regional