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Canadian  
Chiropractic  
Association

## CCA Master Class Webinar

Applying research to practice - A review of  
articles in the JCCA Vol. 66 No. 2

### Facilitator:

- Dr. Kent Stuber, DC, PhD, Editor of the JCCA

### Moderator:

- Dr. Crystal Draper, Senior Manager  
of Professional Practice

### Speakers:

- Dr. Michael Edgar, BKins (Hons), DC;
- Dr. Christian Manansala, DC, MSc; &
- Dr. Gerald Olin, BSc, DC



Journal of  
the Canadian  
Chiropractic  
Association

*CCA Master Class Series*



**Mount Carmel**  
CLINIC



**Publicly Funded Chiropractic Care**

**Dr. Christian Manansala, BSc., D.C., MSc.**

**Dr. Gerald Olin, B.Sc., D.C., C.Dir.**



## **Mount Carmel Clinic – Chiropractic Clinic**

# **Disclaimer**

- This study was funded by the Canadian Chiropractic Association (CCA). However, the CCA had no influence over the reported results, data reduction, analysis, or statistical modelling. Statistical tests were performed by an individual who had no contact with the granting organization directly or indirectly throughout the process.
- Dr. Olin was a CCA board member from April 2013 to June 2022 and served as board chair from June 2018 to June 2020. Dr. Olin was not involved in any decision making by the CCA as it relates to the funding of this research.
- Dr. Manansala has no conflicts to report.

## Mount Carmel Clinic – Chiropractic Clinic

- How was the MCC Chiropractic Clinic conceived?
  - 2009 >>>> multiple meetings between the MCA and the Province of Manitoba
  - 2011 >>>> opening of the MCC chiropractic clinic



## Mount Carmel Clinic — Chiropractic Clinic

### **Goal and Mandate for MCC Chiropractic Clinic 2011 to present:**

#### **Goal of MCC Chiropractic Clinic**

- To improve access and coverage of chiropractic services for low-income Manitobans living in inner-city Winnipeg.

#### **Mandate of MCC Chiropractic Clinic**

- Equitable healthcare benefits and services for low-income people
- To reduce barriers for low-income Manitobans to access chiropractic treatment within the MCC multidisciplinary clinic (chiropractic, physicians, nurse practitioners, dental, dietician, midwifery, diabetes clinic, reproductive/sexual health, foot care clinic)

# Mount Carmel Clinic – Chiropractic Clinic

## Referral Protocols:

- Referrals are encouraged within the clinic
- Primary source of referrals within the chiropractic clinic are from physicians and the medical team within Mount Carmel Clinic
- When a condition is beyond the scope of chiropractic practice, the patient is referred to another healthcare provider in the clinic

## Hours, Fees and Funding at MCC:

### Scheduling Protocols

- The program operates a chiropractic clinic for 2 five-hour days per week

### Billing Protocols

- There are no fees for service for patients being treated at the Mount Carmel Clinic to see the clinic chiropractor, Dr. Audrey Toth

### Funding Model

- The Province of Manitoba via the Department of Family Services funds the operations of the chiropractic clinic.
- The clinic recently completed its 11<sup>th</sup> year of operation

## Mount Carmel Clinic — Chiropractic Clinic

### Quality Assurance/Research/Data Collection/Outcome Measurement Opportunities:

- MCC chiropractic clinic data collection is set up to collect, analyze and project chiropractic utilization and outcome measures using a retrospective analysis of data collected over time
- First published paper appeared in the December 2015 edition of the Journal of the Canadian Chiropractic Association (JCCA)

### Initial integration of chiropractic services into a provincially funded inner city community health centre: a program description

Steven R. Passmore, DC, PhD<sup>1,2</sup>  
Audrey Toth, DC<sup>3</sup>  
Joel Kanovsky, DC<sup>3</sup>  
Gerald Olin, BSc, DC<sup>4,7</sup>



The Journal of the Canadian Chiropractic Association

## Mount Carmel Clinic – Chiropractic Clinic

### MCC Published Research (2015 - Present)

- Passmore, S.R., Toth, A., Kanovsky, J., Olin, G. (2015). Initial integration of chiropractic services into a provincially funded inner city community health centre: a program description. *Journal of the Canadian Chiropractic Association*, doi: 59, 363-372.
- Manansala, C., Passmore, S.R., Pohlman, K., Toth, A., Olin, G., (2019). Change in young peoples' spine pain following chiropractic care at a publicly funded healthcare facility in Canada. *Complementary Therapies in Clinical Practice*, doi: 35, 301-307.
- Reichardt, R., Passmore, S.R., Toth, A., Olin, G. (2022). Utilization of chiropractic services in patients with osteoarthritis and spine pain at a publicly funded healthcare facility in Canada: a retrospective study. *Journal of Back and Musculoskeletal Rehabilitation*. doi: 10.3233/BMR-210192.
- Passmore, S.R., Malone, Q., Manansala, Ferbers, S., C., Toth, E.A., Olin, G.M. (2022). A retrospective analysis of pain changes and opioid use patterns temporally associated with a course of chiropractic care at a publicly funded inner-city facility. *Journal of the Canadian Chiropractic Association*.
- Sophie Morham, Amber Reichardt, Audrey Toth, Gerald Olin, Katie Pohlman, Steven Passmore. "Patient characteristics and clinical outcomes associated with conservative treatment for spine pain in socioeconomically disadvantaged women", *Association of Chiropractic Colleges Research Agenda Conference (ACC RAC)*, San Diego, 2022 (JMPT under review).
- Passmore, S., Malone, Q., Manansala, C., Toth, A., Olin, G. (March 2022) A retrospective analysis of pain changes and opioid use patterns temporally associated with a course of chiropractic care at a publicly funded inner-city facility. *CARLoquium, Online Poster*.

## Mount Carmel Clinic — Chiropractic Clinic

### **The 2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain (Busse et al., 2017)**

Dr. Jason Busse (chiropractor) is the Canada Research Chair in Prevention and Management of Chronic Pain at McMaster; his prior positions included Associate Professor, Department of Anesthesia, Department of Health Research Methods, Evidence, and Impact at McMaster University (2016)

#### **Recommendation of key relevance in 2017 Guideline include:**

##### **Guideline for opioid therapy recommendation 1:**

“When considering therapy for patients with chronic non-cancer pain, we recommend optimization of non-opioid pharmacotherapy and non-pharmacologic therapy, rather than a trial of opioids (**strong recommendation**)”

##### **Barriers to achieve recommendations:**

- Low-income individuals may be unable to access such CPG recommended treatment options.
- Low-income individuals may not have equitable access to chiropractic care as a treatment option due to financial barriers even though it is less harmful form of treatment than prescription opioids.

## Mount Carmel Clinic – Chiropractic Clinic

Offering chiropractic services on-site at MCC – clinically helps achieve several guideline recommendations:

- Helps achieve national and international clinical practice guideline recommendations for:
  - cervical spine pain (CSP) (Bussieres et al., 2016)
  - lumbar spine pain (LSP) management (Qaseem et al., 2017)
- Helps achieve best practice recommendations related to the 2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain:
  - opioid avoidance (Busse et al., 2017)
- Creates a referral option to chiropractic care for primary care practitioners when they identify patients with a history of addiction displaying potential drug-seeking behaviour for mechanical neck, back or MSK pain.

# Association of Chiropractic Care With Receiving an Opioid Prescription for Noncancer Spinal Pain Within a Canadian Community Health Center: A Mixed Methods Analysis

[Peter C. Emary DC, MSc](#) [Amy L. Brown DC](#) [Mark Oremus MSc, PhD](#) [Lawrence Mbuagbaw MD, MPH, PhD](#)  
[Douglas F. Cameron DC](#) [Jenna DiDonato HBSc \(Kin\)](#) [Jason W. Busse DC, MSc, PhD](#)

Journal of Manipulative and Physiological Therapeutics (JMPT) – August 2022

## Objective of Study:

- The purpose of this study was to examine the association between receipt of [chiropractic](#) services and initiating a prescription for opioids among adult patients with noncancer [spinal pain](#) in a Canadian community health center.

## Methods:

- Retrospective study of 945 patients between January 2014 and December 2020 and completed interviews with 14 patients and 9 general practitioners.

## Results:

- 24% of patients (227 of 945) with noncancer spinal pain received a prescription for opioids.

- The risk of initiating a Rx for opioids at 1 year after presentation was 52% lower in chiropractic recipients vs. nonrecipients of chiropractic care – and- 71% lower in patients who received chiropractic services within 30 days of their 1<sup>st</sup> visit.

## Conclusion:

- Patients with noncancer spinal pain who received chiropractic care were less likely to obtain a Rx for opioids than patients who did not receive chiropractic care.**

Mount Carmel Clinic — Chiropractic Clinic

**A retrospective analysis of pain changes and opioid usage associated with chiropractic care in a publicly funded inner-city facility**

**Authors: Steven Passmore, Quinn Malone, Christian Manansala, Spencer Ferbers, E. Audrey Toth, Gerald M. Olin**

**August 2022**



The Journal of the Canadian Chiropractic Association



UNIVERSITY  
OF MANITOBA

## Mount Carmel Clinic — Chiropractic Clinic

### **Purpose of MCC 2022 Study:**

To determine if chiropractic management including spinal manipulation was associated with decreased pain or opioid usage in financially disadvantaged individuals utilizing opioid medications and diagnosed with musculoskeletal conditions.

### **Inclusion criteria:**

- (a) experience pain >3 months duration,
- (b) history of opioid utilization at admission or during their care, and
- (c) received a course of chiropractic care

### **Eligibility for chiropractic treatment criteria:**

- (a) residence in a pre-identified low-income neighborhood,
- (b) lack health insurance coverage for chiropractic care, and
- (c) Immigrants and refugees to Canada living in pre-determined geographic locales for less than three years. Sociodemographic information derived from the eligible patient files is provided in Table 1.

## Mount Carmel Clinic — Chiropractic Clinic

### Treatments:

- Patients received a Hx, PHx, followed by a pragmatic course chiropractic care.
- Chiropractic care could consist of:
  - SMT/mobilization, STT, therapeutic modality, home exercise, advice, and/or taping.
  - All treatments were delivered by a licensed chiropractor.
- Re-evaluation after every 4-6 treatment visits to assess response to care.

### Methods:

- Ethics approval for this study was granted by UofM Health Research Ethics Board.
- 482 unique patients treated by the chiropractic program in the analyzed timeframe (January 2011 to December 2017) at MCC
  - ✧ 62 individuals met the inclusion criteria
  - ✧ had a relationship with opioid medication, either prescribed internally, prescribed externally, or self-reported active street use)

### *Statistical analyses:*

- p-values and the level of significance was set to  $\alpha=0.05$ .
- The **McNemar's test** used and is a statistical test used to determine if there are differences on a dichotomous dependent variable between two related groups.

## Mount Carmel Clinic – Chiropractic Clinic

Table 1: Demographic breakdown of patients who used opioids treated in the chiropractic program at the Mount Carmel Clinic (2011-2017)

Characteristic	N (%), or mean (SD) [range]
Total Patients	62 (100%)
Age (years)	48.6 (13.6) [19-83]
BMI <sup>a</sup> (kg/m <sup>2</sup> )	31.6 (8.46) [18.24-49.75]
Gender <sup>b</sup>	
Men	24 (38.7%)
Women	38 (61.3%)
Ethnicity <sup>b</sup>	
Caucasian	30 (48.4%)
Metis	15 (24.2%)
First Nations	15 (24.2%)
African	1 (1.61%)
Latino	1 (1.61%)
Chronic Pain Region at Baseline	
Cervical	23 (37.1%)
Thoracic	40 (64.5%)
Lumbar	50 (80.6%)
Sacral	41 (66.1%)
Extremity	34 (54.8%)
Referrals	
Referred by PCP <sup>c</sup>	42 (67.7%)
Referred back to PCP post-treatment	5 (8.1%)
No further referral needed post-treatment	57 (91.9%)

<sup>a</sup>Body Mass Index. <sup>b</sup>Self-identified by patients. <sup>c</sup>Primary Care Provider.

BL to V5 [NRS reductions] : CS 2.50, TS, 3.15, LS 2.72, SI 2.97, Ext 3.48  
BL to DIS [NRS reductions] : CS 2.63, TS 3.11, LS 3.56, SI 3.72, Ext 3.78  
V5 to DIS [NRS reductions] : CS .125, TS +.037, LS .844, SI .750, Ext .304

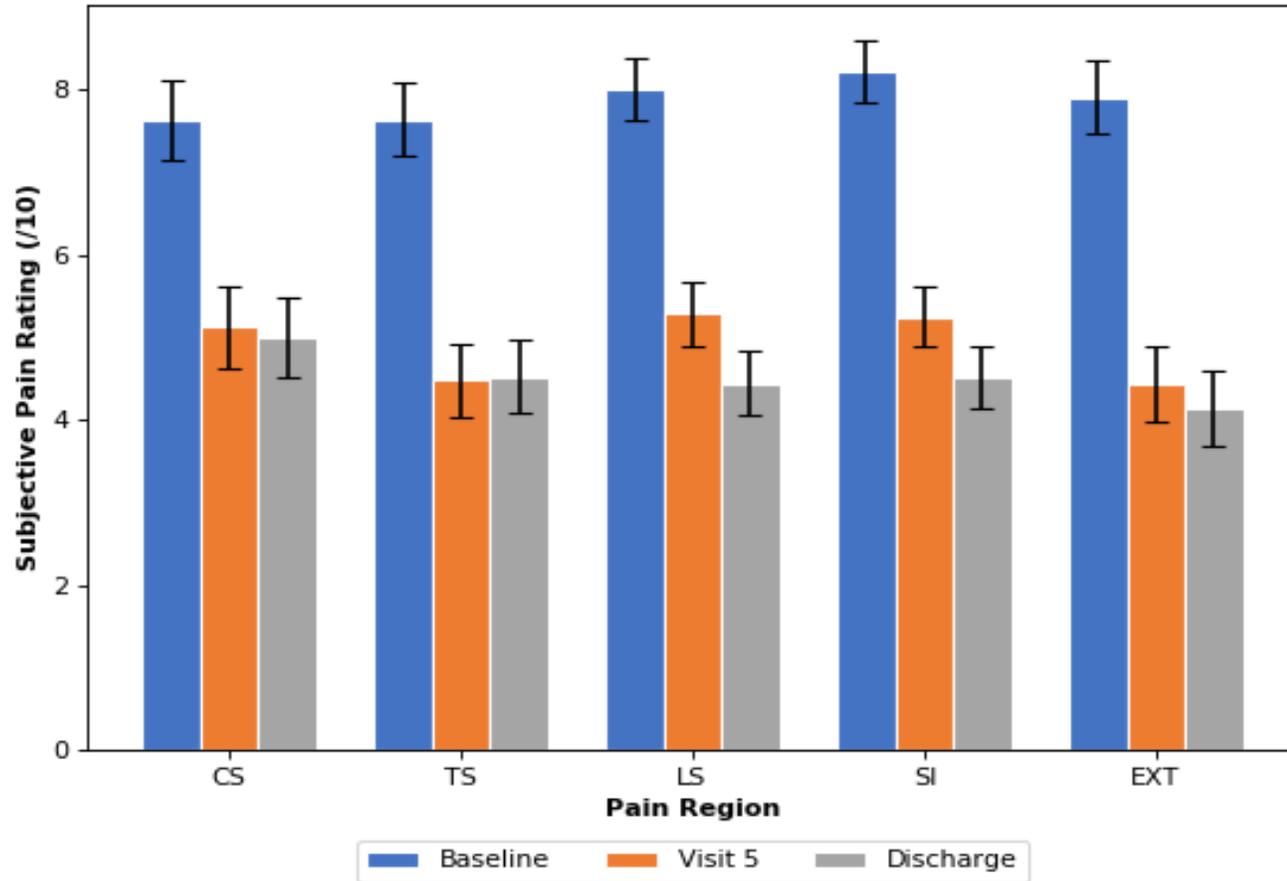


Figure 1 – Table 2: Self-reported spine pain across a course of chiropractic care for patients who used opioids treated in the chiropractic program at the Mount Carmel Clinic (2011-2017)

•Error bars represent standard error.

## Mount Carmel Clinic – Chiropractic Clinic

		Discharge					
Baseline		No Utilization		Utilization		Total	
No Utilization		19*		4 patients utilized opioids at discharge but not at baseline		23	
Utilization		15 patients utilized opioids at baseline but not at discharge		24		39	
Total		34		28		62	
McNemar's Test							
		Value		df		p	
$\chi^2$		6.37		1		<b>0.012</b>	
N		62					

Table 4: Contingency table and results of McNemar's test for differences between opioid utilization at baseline and discharge for patients who used opioids treated in the chiropractic program at the Mount Carmel Clinic (2011-2017)

\*Used opioids at some point during the course of care but did not at baseline or discharge.

### Mount Carmel Clinic — Chiropractic Clinic

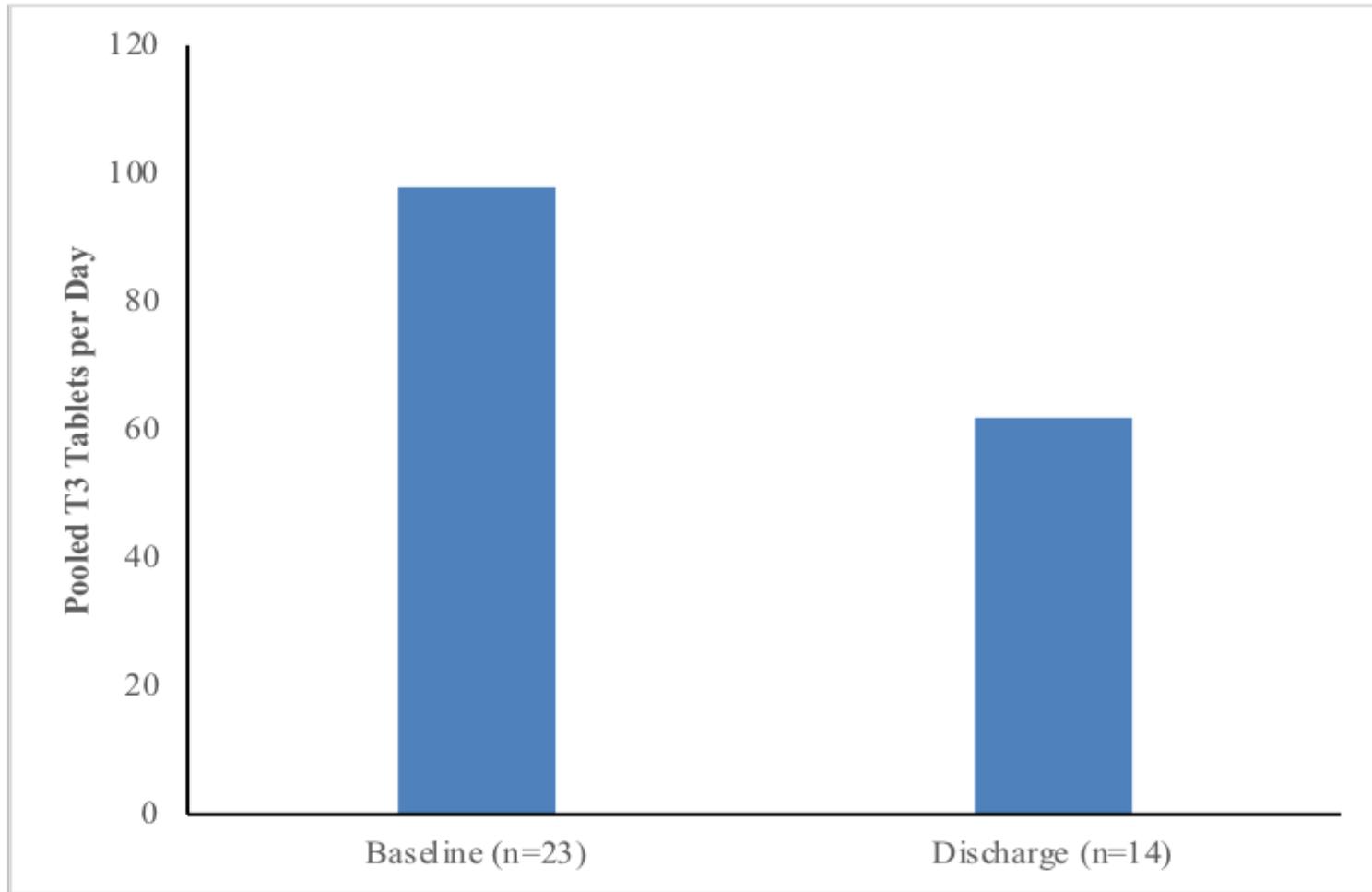


Figure 2: Difference between baseline and discharge pooled Tylenol 3 usage per day

## Mount Carmel Clinic — Chiropractic Clinic

### Conclusions and Clinical Relevance:

- Provides evidence of clinically and statistically significant pain reduction concomitant with publicly funded chiropractic management in a low-income population who utilized opioids.
  - ✓ Pain scores dropped significantly
  - ✓ Reduced opioid utilization.
  - ✓ Daily T3 tablet utilization decreased.
  - ✓ 91.9% of patients did not require further referral.
- Evidentiary support for chiropractic care for those utilizing opioids for chronic MSK pain.
- Chiropractors can feel confident in communicating with other health care providers in your communities as to the benefits of chiropractic treatment for chronic MSK complaints
- Influence health care policy stakeholders

# Thank You



## Mount Carmel Clinic – Chiropractic Clinic

### **Limitations to the current study:**

- As this is a retrospective analysis, this design makes it challenging to confirm causation.
- The lack of control over additional comorbidities and life circumstances of the sample population mean that unpredicted factors may have impacted patient outcomes.
- The use of a design that does not require a control group means that the effects of time or other interventions were not controlled for.
- The population is somewhat heterogenous, in that while all patients utilized opioids medications, some patients were prescribed opioid medications, while others admitted self-medicating with opioids that were not attained through prescription or legal sources.
- It is understood that chronic pain may fluctuate over time, but is not likely to spontaneously resolve, and the treatments offered were congruent with CPG recommendations, and the resulting improvements following chiropractic treatment observed are promising and should not be discounted; they can be a catalyst for further prospective studies.

## Mount Carmel Clinic — Chiropractic Clinic

### ***Pain:***

• ***Pain by region and time point Pain level*** decreased by clinically and statistically significant levels over a course of care from baseline compared to visit 5 and baseline compared to time of discharge for patients using opioid medications.

• **Pain was reduced** by amounts exceeding minimally clinically important differences (MCID) in all anatomical regions.

- The minimally clinically important differences (MCID) was determined to be 2-points on the pain rating Likert scale [11].

## Mount Carmel Clinic – Chiropractic Clinic

### T3 Tablet Usage per 24-Hour Period:

- Tylenol 3 tablets (T3 - 30mg of codeine phosphate) were the most commonly prescribed opioid for patients treated as chiropractic clinic patients between BL and DIS.
- At BL the pooled daily usage of T3 tablets:
  - 98 tablets per day based on a sample size of 23 patients.
- At DIS the pooled daily usage of T3 tablets reduced to:
  - 62 tablets per day.
- There was a 36.7% reduction in pooled daily usage of T3's following a course of chiropractic care (Figure 2).
- Upon closer examination, the relationship is linked to the number of patients continuing to be utilizing T3 prescriptions.
  - Individuals taking T3 tablets were consuming approximately the same amount on average per person at the start and the end of care:
  - At Baseline:  $98 \text{ tablets} / 23 \text{ people} = 4.26 \text{ tablets per person}$
  - At Discharge:  $62 \text{ tablets} / 14 \text{ people} = 4.43 \text{ tablets per person}$
- Overall fewer people 14/23 remained on T3's by the end of a course of care. There was a 39.1% reduction in patients using T3's at discharge.

# Disclaimer

- No conflicts of interest to declare
- Free open access application

# This App Aims To...

- Improve individualization of exercise programs
- Reduce clinician time allocation
- Reduce poor adherence
- Provide a free alternative to practitioners

# Exercise Prescription App for Family Medicine

M. Edgar, D. Kopansky-Giles,  
C. Lambert, R. Girdhari,  
L. Miller, W. Mclsaac,  
R. Monteiro, LM Schofield,  
A. Abbas

## Background:

- Musculoskeletal disorders (MSDs) are a common complaint in primary care
- Exercise is efficacious in the management of MSDs
- Prescribing individualized exercise programs are challenging in family medicine due to time constraints and knowledge around what exercises are optimal for patients

## Objectives:

- To create a Family Medicine EHR embedded exercise application
- To evaluate the utility of the exercise app for providers
- To evaluate the usefulness of the exercise app from the perspective of patients

Patient Information entry



Date:

Patient Name:

Email Address:

Phone Number:

Protocol Weeks:

Consent to Email:

CREATE

Populate

EMAIL

PRINT

Pre Made Templates	Tennis and Golfers Elbow	< Drop Down Menu
Enter Exercise Below	Region	Enter Sets Below
Exercise-1 Wrist Extension Stretch	Wrist	1
Exercise-2 Wrist Flexion Stretch	Wrist	1
Exercise-3 Free Weight - Wrist Extensi	Wrist	3
Exercise-4 Free Weight - Wrist Flexion	Wrist	3
Exercise-5 Hammer Pronation-Supinat	Wrist	3
Exercise-6 Stress Ball Squeeze	Hand	1
Exercise-7 Finger Stretch	Hand	1
Exercise-8		

Enter Template Name Below

Frozen Shoulder

Populate

#	Exercise	Category	Sets	Reps	Seconds	Video URL
#	Shoulder AAROM (abduction)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com">https://player.vimeo.com</a>
#	Shoulder AAROM (ER)	Shoulder	3	12 to 15		<a href="https://www.youtube.com">https://www.youtube.com</a>
#	Shoulder AAROM (flexion)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com">https://player.vimeo.com</a>
#	Shoulder AAROM (HBB)	Shoulder	3		30	<a href="https://media.physitrack">https://media.physitrack</a>
#	Shoulder AROM (scaption)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com">https://player.vimeo.com</a>

## Development:

- Primary care clinicians and IT specialists collaborated to develop the app and embed it into the HER
- Iteratively developed based on feedback from clinician pre-testing process
- Anecdotal feedback from patients also used to inform pre-testing adaptations
- Final version embedded in EHR and on internal website in preparation for formal pilot testing

Exercise directory

Sort By Exercise | Sort By Category | Remove Dups

#	Exercise	Category	Sets	Reps	Seconds	Video URL	Picture URL	Picture File Name
1	Wrist Extension Stretch	Wrist	1	15		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Wrist Extension Str
2	Wrist Flexion Stretch	Wrist	1	15		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Wrist Flexor Stretch
3	Free Weight - Wrist Extensi	Wrist	3	15-20		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Free Weight - Wrist
4	Free Weight - Wrist Flexion	Wrist	3	15-20		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Free Weight - Wrist
5	Hammer Pronation-Supinat	Wrist	3	12-15		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Hammer Pronation-
6	Stress Ball Squeeze	Hand	1	10		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Stress Ball Squeez
7	Finger Stretch	Hand	1	10		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Finger Stretch.jpg

Holo John, This exercise plan has been prescribed to you by your health care professional for physical rehabilitation purposes.

Perform this rehabilitative exercise plan once daily unless specified otherwise.

**FITT Principle**

- Frequency - How often you exercise
- Intensity - How hard you exercise
- Time - How long you exercise
- Type - What kind of exercise you do

**Exercise Parameters**

- Reps - the number of times you perform a specific exercise
- Sets - the number of cycles of reps that you complete
- Rest - the amount of time between sets

**Exercise Intensity Based on Maximum Heart Rate**

Calculate Maximum Heart Rate = (220 - Age)

- Low Intensity - Less than 70% (you can carry a conversation while exercising)
- Moderate Intensity - 70 to 85% (you can talk in short bursts between breaths)
- High Intensity - Greater than 85% (you are unable to talk during exercise)

**Types of Exercise**

- Aerobic Exercise - tends to be longer duration with greater improvements in cardiorespiratory fitness
- Resistance Exercise - tends to involve an external load and effects muscular strength

**Benefits of Exercise - Canadian 24-Hour Movement Guidelines**

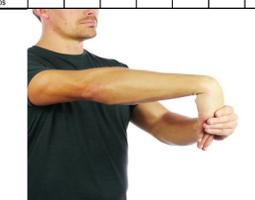
- A lower risk of mortality, cardiovascular disease, hypertension, type 2 diabetes, several cancers, anxiety, depression, dementia, weight gain, adverse blood lipid profile
- Improved bone health, cognition, quality of life and physical function.

[Visit www.casaguidelines.ca/for-more-information](http://www.casaguidelines.ca/for-more-information)

Please notify your health care professional if you experience worsening of symptoms.

Exercise-1 Wrist Extension Stretch Wrist  
Sets: 100-01-04  
Reps: 15  
TUT: 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



Exercise-2 Wrist Flexion Stretch Wrist  
Sets: 100-01-04  
Reps: 15  
TUT: 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								

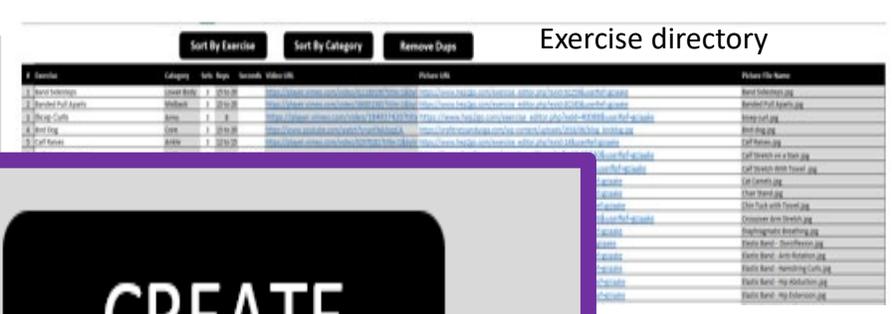
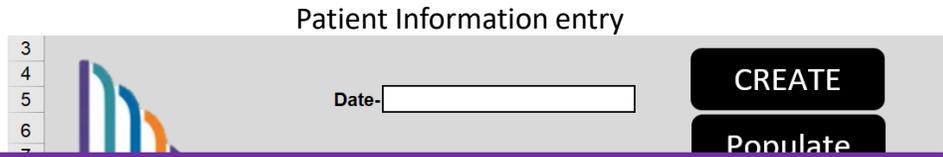


Auto-generated PDF exercise prescription, patient log and guidelines

## Conclusion:

A customizable, open-source exercise app can be integrated into a family medicine electronic health record to support patient self-management of MSDs. Pilot testing is in process.

# Exercise Prescription App for Family Medicine





Date-

Patient Name-

Email Address-

Phone Number-

Protocol Weeks-

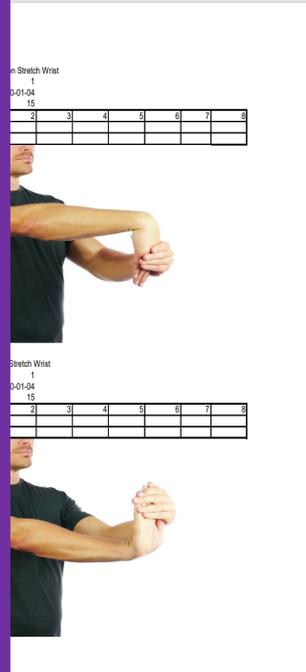
Consent to Email-

**CREATE**

**Populate**

**EMAIL**

**PRINT**



The app can be integrated into a family medicine electronic health record to support patient self-management of MSDs. Pilot testing is in process.

- M
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  - E
  - P
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- 1.
  - 2.
  3. To evaluate the usefulness of the exercise app from the perspective of patients

pre-testing adaptations

- Final version embedded in EHR and on internal website in preparation for formal pilot testing

# Exercise Prescription App for Family Medicine

M. Edgar, D. Kopansky-Giles,  
C. Lambert, B. Giridhari

Patient Information entry

3  
4  
5  
6  
7  
8  
9



Date:

Patient Name:

Email Address:

CREATE

Populate

EMAIL

Exercise directory

Sort By Exercise | Sort By Category | Remove Dups

#	Name	Category	Sets	Reps	Weeks	Video URL	Picture URL	Picture File Name
1	Wrist Extension Stretch	Wrist	1	5	15	<a href="https://play...">https://play...</a>	<a href="https://www.he...">https://www.he...</a>	Wrist Extension Stre
2	Wrist Flexion Stretch	Wrist	1	5	15	<a href="https://play...">https://play...</a>	<a href="https://www.he...">https://www.he...</a>	Wrist Flexor Stretch
3	Free Weight - Wrist Extension	Wrist	3	15-20		<a href="https://play...">https://play...</a>	<a href="https://www.he...">https://www.he...</a>	Free Weight - Wrist
4	Free Weight - Wrist Flexion	Wrist	3	15-20		<a href="https://play...">https://play...</a>	<a href="https://www.he...">https://www.he...</a>	Free Weight - Wrist
5	Hammer Pronation-Supination	Wrist	3	12-15		<a href="https://play...">https://play...</a>	<a href="https://www.he...">https://www.he...</a>	Hammer Pronation-
6	Stress Ball Squeeze	Hand	1	10			<a href="https://www.he...">https://www.he...</a>	Stress Ball Squeeze
7	Finger Stretch	Hand	1	10			<a href="https://www.he...">https://www.he...</a>	Finger Stretch.jpg
8								

Pre Made Templates	Tennis and Golfers Elbow	< Drop Down Menu
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Exercise-6 Stress Ball Squeeze	Hand	
Exercise-7 Finger Stretch	Hand	
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A customizable, open-source exercise app can be integrated into a family medicine electronic health record to support patient self-management of MSDs. Pilot testing is in process.

# Exercise Prescription App for Family Medicine

M. Edgar, D. Kopansky-Giles,  
C. Lambert, R. Girdhari,  
L. Miller, W. Mclsaac,  
R. Monteiro, LM Schofield,  
A. Abbas

Patient Information entry

Exercise directory

#	Exercise	Category	Sets	Reps	Seconds	Video URL	Video File Name
1	Shoulder AAROM (abduction)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com/...">https://player.vimeo.com/...</a>	Shoulder AAROM (abduction).jpg
2	Shoulder AAROM (ER)	Shoulder	3	12 to 15		<a href="https://www.youtube.com/...">https://www.youtube.com/...</a>	Shoulder AAROM (ER).jpg
3	Shoulder AAROM (flexion)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com/...">https://player.vimeo.com/...</a>	Shoulder AAROM (flexion).jpg
4	Shoulder AAROM (HBB)	Shoulder	3		30	<a href="https://media.physitrack/...">https://media.physitrack/...</a>	Shoulder AAROM (HBB).jpg
5	Shoulder AROM (scaption)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com/...">https://player.vimeo.com/...</a>	Shoulder AROM (scaption).jpg

Pre Made Templates    Tennis and Golfers Elbow    < Drop Down Menu

Enter Template Name Below

Frozen Shoulder

**Populate**

#	Exercise	Category	Sets	Reps	Seconds	Video URL
#	Shoulder AAROM (abduction)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com/...">https://player.vimeo.com/...</a>
#	Shoulder AAROM (ER)	Shoulder	3	12 to 15		<a href="https://www.youtube.com/...">https://www.youtube.com/...</a>
#	Shoulder AAROM (flexion)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com/...">https://player.vimeo.com/...</a>
#	Shoulder AAROM (HBB)	Shoulder	3		30	<a href="https://media.physitrack/...">https://media.physitrack/...</a>
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patients

preparation for formal pilot testing

Pilot testing is in process.

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Patient Information entry



Date:

Patient Name:

Email Address:

Phone Number:

Protocol Weeks:

Consent to Email:

CREATE

Populate

EMAIL

PRINT

Exercise directory

Sort By Exercise | Sort By Category | Remove Dups

#	Name	Category	Sets	Reps	Interval	Video URL	Picture URL	Picture File Name
1	Hand Exercises	Upper Body	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../hand-exercises</a>	<a href="#">https://www.stmichaelshospital.com/.../hand-exercises.jpg</a>	Hand Exercises.jpg
2	Shoulder Full Range	Shoulder	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../shoulder-full-range</a>	<a href="#">https://www.stmichaelshospital.com/.../shoulder-full-range.jpg</a>	Shoulder Full Range.jpg
3	Wrist-Cuffs	Wrist	1	10	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-cuffs</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-cuffs.jpg</a>	Wrist-Cuffs.jpg
4	Arm Drg	Core	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../arm-drg</a>	<a href="#">https://www.stmichaelshospital.com/.../arm-drg.jpg</a>	Arm Drg.jpg
5	Ball Stretch	Ball	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch</a>	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch.jpg</a>	Ball Stretch.jpg
6	Ball Stretch on a Ball	Ball	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch-on-a-ball</a>	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch-on-a-ball.jpg</a>	Ball Stretch on a Ball.jpg
7	Ball Stretch with Towel	Ball	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch-with-towel</a>	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch-with-towel.jpg</a>	Ball Stretch with Towel.jpg
8	Ball Stretch	Ball	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch</a>	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch.jpg</a>	Ball Stretch.jpg
9	Chair Stand	Lower Body	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../chair-stand</a>	<a href="#">https://www.stmichaelshospital.com/.../chair-stand.jpg</a>	Chair Stand.jpg
10	Chair Stand with Towel	Chair	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../chair-stand-with-towel</a>	<a href="#">https://www.stmichaelshospital.com/.../chair-stand-with-towel.jpg</a>	Chair Stand with Towel.jpg
11	Conscious Arm Stretch	Shoulder	1	1	10-15	<a href="#">https://www.stmichaelshospital.com/.../conscious-arm-stretch</a>	<a href="#">https://www.stmichaelshospital.com/.../conscious-arm-stretch.jpg</a>	Conscious Arm Stretch.jpg
12	Psychomotor Breathing	Core	1	1	30	<a href="#">https://www.stmichaelshospital.com/.../psychomotor-breathing</a>	<a href="#">https://www.stmichaelshospital.com/.../psychomotor-breathing.jpg</a>	Psychomotor Breathing.jpg
13	Wrist Band - Dorsiflexion	Wrist	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-dorsiflexion</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-dorsiflexion.jpg</a>	Wrist Band - Dorsiflexion.jpg
14	Wrist Band - Arm Extension	Wrist	1	10	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-arm-extension</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-arm-extension.jpg</a>	Wrist Band - Arm Extension.jpg
15	Wrist Band - Wrist Flexion	Wrist	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-wrist-flexion</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-wrist-flexion.jpg</a>	Wrist Band - Wrist Flexion.jpg
16	Wrist Band - Hip Abduction	Hip	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-hip-abduction</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-hip-abduction.jpg</a>	Wrist Band - Hip Abduction.jpg
17	Wrist Band - Hip Extension	Hip	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-hip-extension</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-hip-extension.jpg</a>	Wrist Band - Hip Extension.jpg

## Background:

- Musculoskeletal common com
- Exercise is eff management
- Prescribing in programs are medicine due knowledge an optimal for p

Sort By Exercise | Sort By Category | Remove Dups

#	Name	Category	Sets	Reps	Interval	Video URL	Picture URL	Picture File Name
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2	Shoulder Full Range	Shoulder	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../shoulder-full-range</a>	<a href="#">https://www.stmichaelshospital.com/.../shoulder-full-range.jpg</a>	Shoulder Full Range.jpg
3	Wrist-Cuffs	Wrist	1	10	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-cuffs</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-cuffs.jpg</a>	Wrist-Cuffs.jpg
4	Arm Drg	Core	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../arm-drg</a>	<a href="#">https://www.stmichaelshospital.com/.../arm-drg.jpg</a>	Arm Drg.jpg
5	Ball Stretch	Ball	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch</a>	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch.jpg</a>	Ball Stretch.jpg
6	Ball Stretch on a Ball	Ball	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch-on-a-ball</a>	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch-on-a-ball.jpg</a>	Ball Stretch on a Ball.jpg
7	Ball Stretch with Towel	Ball	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch-with-towel</a>	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch-with-towel.jpg</a>	Ball Stretch with Towel.jpg
8	Ball Stretch	Ball	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch</a>	<a href="#">https://www.stmichaelshospital.com/.../ball-stretch.jpg</a>	Ball Stretch.jpg
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13	Wrist Band - Dorsiflexion	Wrist	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-dorsiflexion</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-dorsiflexion.jpg</a>	Wrist Band - Dorsiflexion.jpg
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15	Wrist Band - Wrist Flexion	Wrist	1	10-15	30	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-wrist-flexion</a>	<a href="#">https://www.stmichaelshospital.com/.../wrist-band-wrist-flexion.jpg</a>	Wrist Band - Wrist Flexion.jpg
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Exercise-1 Wrist Extension Stretch Wrist

Sets: 1  
Reps: 100-1-04  
TUT: 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



Exercise-2 Wrist Flexion Stretch Wrist

Sets: 1  
Reps: 100-1-04  
TUT: 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



exercise prescription,  
patient log and guidelines

## Conclusion:

A customizable, open-source exercise app can be integrated into a family medicine electronic health record to support patient self-management of MSDs. Pilot testing is in process.

## Development:

- Primary care clinicians and IT specialists collaborated to develop the app and embed it into the HER
- Iteratively developed based on feedback from clinician pre-testing process
- Anecdotal feedback from patients also used to inform pre-testing adaptations
- Final version embedded in EHR and on internal website in preparation for formal pilot testing

Hello John,



This exercise plan has been prescribed to you by your health care professional for physical rehabilitation purposes.

Perform this rehabilitative exercise plan once daily unless specified otherwise.

FITT Principle

- Frequency - How often you exercise
- Intensity - How hard you exercise
- Time - How long you exercise
- Type - What kind of exercise you do

Exercise Parameters

- Reps - the number of times you perform a specific exercise
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Calculate Maximum Heart Rate = (220 - Age)

1. Low Intensity - Less than 70% (you can carry a conversation while exercising)
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- A lower risk of mortality, cardiovascular disease, hypertension, type 2 diabetes, several cancers, anxiety, depression, dementia, weight gain, adverse blood lipid profile
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Visit [www.csepguidelines.ca](http://www.csepguidelines.ca) for more information

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Exercise-1 Wrist Extension Stretch Wrist

Sets- 1  
Reps- 1900-01-04  
TUT- 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



Exercise-2 Wrist Flexion Stretch Wrist

Sets- 1  
Reps- 1900-01-04  
TUT- 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



Filter by Name

<a href="#">Wrist Extension Stretch Wrist</a>	<a href="#">Wrist Extension Stretch Wrist</a>
<a href="#">Wrist Flexion Stretch Wrist</a>	<a href="#">Wrist Flexion Stretch Wrist</a>
<a href="#">...</a>	<a href="#">...</a>

Wrist Extension Stretch Wrist

Sets- 1  
Reps- 1900-01-04  
TUT- 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



Wrist Flexion Stretch Wrist

Sets- 1  
Reps- 1900-01-04  
TUT- 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



Exercise app can be used for electronic health management of MSDs.

Background

- Musculoskeletal disorders are common
- Exercise is a key component of management
- Prescribing exercise programs requires clinical medicine knowledge and optimal for

Objectives

1. To create an exercise plan
2. To evaluate the effectiveness of the exercise plan
3. To evaluate the impact of the exercise plan on patient health

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## Background:

- Musculoskeletal disorders (MSDs) are a common complaint in primary care
- Exercise is efficacious in the management of MSDs
- Prescribing individualized exercise programs are challenging in family medicine due to time constraints and knowledge around what exercises are optimal for patients

## Objectives:

- To create a Family Medicine EHR embedded exercise application
- To evaluate the utility of the exercise app for providers
- To evaluate the usefulness of the exercise app from the perspective of patients

Patient Information entry

3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13

Date:

Patient Name-   
 Email Address-   
 Phone Number-   
 Protocol Weeks-   
 Consent to Email-

Pre Made Templates	Tennis and Golfers Elbow	< Drop Down Menu
Enter Exercise Below	Region	Enter Sets Below
Exercise-1 Wrist Extension Stretch	Wrist	1
Exercise-2 Wrist Flexion Stretch	Wrist	1
Exercise-3 Free Weight - Wrist Extensi	Wrist	3
Exercise-4 Free Weight - Wrist Flexion	Wrist	3
Exercise-5 Hammer Pronation-Supinat	Wrist	3
Exercise-6 Stress Ball Squeeze	Hand	1
Exercise-7 Finger Stretch	Hand	1
Exercise-8		

Enter Template Name Below

#	Exercise	Category	Sets	Reps	Seconds	Video URL
#	Shoulder AAROM (abduction)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com">https://player.vimeo.com</a>
#	Shoulder AAROM (ER)	Shoulder	3	12 to 15		<a href="https://www.youtube.com">https://www.youtube.com</a>
#	Shoulder AAROM (flexion)	Shoulder	3	12 to 15		<a href="https://player.vimeo.com">https://player.vimeo.com</a>
#	Shoulder AAROM (HBB)	Shoulder	3		30	<a href="https://media.physitrack">https://media.physitrack</a>
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Sort By Exercise | Sort By Category | Remove Dups

Exercise directory

#	Exercise	Category	Sets	Reps	Seconds	Video URL	Picture URL	Picture File Name
1	Wrist Extension Stretch	Wrist	1	15		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Wrist Extension Str
2	Wrist Flexion Stretch	Wrist	1	15		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Wrist Flexor Stretch
3	Free Weight - Wrist Extensi	Wrist	3	15-20		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Free Weight - Wrist
4	Free Weight - Wrist Flexion	Wrist	3	15-20		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Free Weight - Wrist
5	Hammer Pronation-Supinat	Wrist	3	12-15		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Hammer Pronation-
6	Stress Ball Squeeze	Hand	1	10		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Stress Ball Squeeze
7	Finger Stretch	Hand	1	10		<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	<a href="https://www.youtube.com/watch?v=...">https://www.youtube.com/watch?v=...</a>	Finger Stretch.jpg

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- Improved bone health, cognition, quality of life and physical function.

[Visit www.casaguidelines.ca/for-more-information](http://www.casaguidelines.ca/for-more-information)

Please notify your health care professional if you experience worsening of symptoms.

Exercise-1 Wrist Extension Stretch Wrist  
Sets: 100-01-04  
Reps: 15  
TUT: 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



Exercise-2 Wrist Flexion Stretch Wrist  
Sets: 100-01-04  
Reps: 15  
TUT: 15

Week	1	2	3	4	5	6	7	8
Sets								
Reps								



Auto-generated PDF exercise prescription, patient log and guidelines

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A customizable, open-source exercise app can be integrated into a family medicine electronic health record to support patient self-management of MSDs. Pilot testing is in process.