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Chiropractic Care in a System Dynamics Model for Minimizing Opioid Abuse for Chronic Non-Malignant Pain Patients

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ACC-RAC
March 18, 2016

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Agenda

• Background—Opioid Use Disorder in Canada
• Purpose
  • Chiropractic care as an alternative/adjunct to opioids
  • Modeling to inform clinical trials
• System Dynamics Model
• Future directions
Opioid-related mortality in Ontario, Canada

Chiropractic delisted from health plan
Can chiropractic change this trend?

• Seeing a chiropractor initially associated with “dramatically lower odds” of long term opioid use¹

• Need clinical trials
  • Expensive
  • Difficult to conduct
  • Long study duration

• Implementation to change is slow

Modeling to inform RCT decision-making

- People getting chiropractic for CP
- People getting opioids for CP
- People with CP abusing opioids
- Overdose deaths
Modeling to inform RCT decision-making

Early treatment with chiropractic

People getting chiropractic for CP

People getting opioids for CP

People with CP abusing opioids

Overdose deaths
Modeling to inform RCT decision-making

People getting chiropractic for CP

People getting opioids for CP

People with CP abusing opioids

Add chiropractic or remove opioid

Overdose deaths
Modeling to inform RCT decision-making

People getting chiropractic for CP

People getting opioids for CP

People with CP abusing opioids

Overdose deaths

Treat pain of people abusing opioids
System Dynamics: Looking at one leverage point

[Diagram showing system dynamics with various nodes and flow arrows, including Canadian population, cp diagnosis rate, opioid risk divisor, and opioid overdose deaths.]

Opioid Overdose Deaths
- Policy effect
- Baseline

Canadian population
<INITIAL TIME> <FINAL TIME>
<CP Patients who developed dependence>
<Patients taking opioids for CP>
<Patients getting chiro for CP>

New chronic pain patients
Base chiro rate

Double chiro remove from opioid
double chiro remove from opioid

Start getting chiro for CP
Successfully stopped chiro
Success rate

Chiro failure rate
Stopping CP opioid treatment
Dying as Chiro pt

Years in opioid treatment
Dying as CP opioid patient
Dependence

Opioid risk divisor
Fraction of patients with dependence

CP Patients who developed dependence

Initial value dep

Initial value dep

Dying as CP opioid patient with dependence

Opioid death increase factor

All cause mortality
Model expansions

- Generating more hypotheses
- More interventions
- Comparing effectiveness
- Cost analysis
- Find where we have greatest leverage
- Proposing RCTs
- Evidence + Modeling
- Applying the greatest leverage
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