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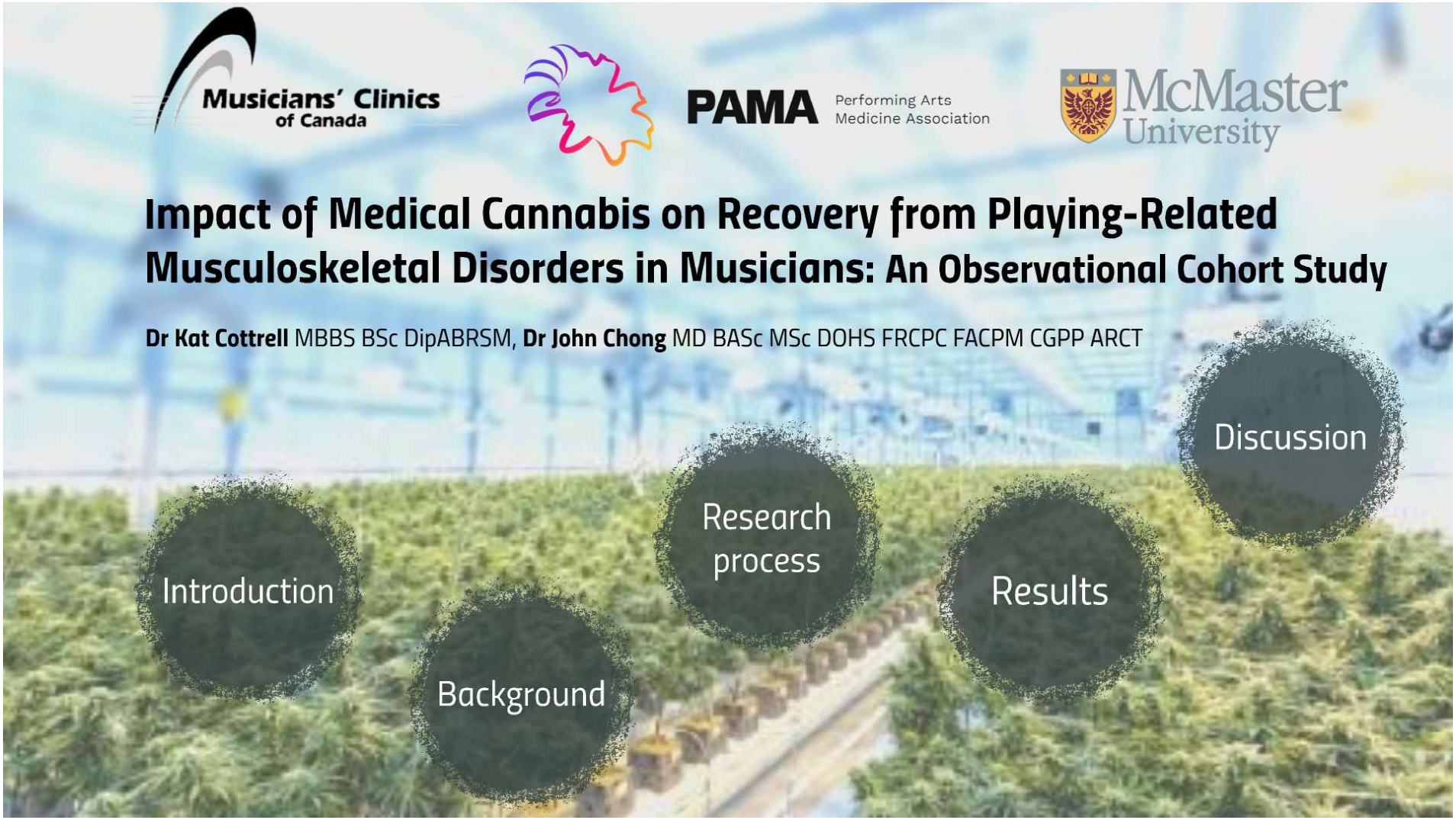
Impact of Medical Cannabis on Recovery from Playing-Related Musculoskeletal Disorders in Musicians: An Observational Cohort Study
Dr Kat Cottrell MBBS BSc DipABRSM, Dr John Chong MD BASc MSc DOHS FRCPC FACPM CGPP ARCT
Introduction
Background
Research process
Results
Discussion

A big thank you to Dr Alice G Brandfonbrener

- Founder of the **Medical Program for Performing Artists** in 1985 at Northwestern University School of Medicine in Chicago
- Founder and chief editor of **Medical Problems of Performing Artists**
- One of the **founders** and the first **president** of PAMA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This study explored the use of **medical cannabis** for **Playing-Related Musculoskeletal Disorders** at the **Musicians' Clinics of Canada**

Medical Cannabis

PRMD

Musicians' Clinics of Canada

Medical Cannabis

- Used for medicinal purposes for >5,000yrs
- Most well studied components:
  - THC (psychoactive)
  - CBD (not-psychoactive)
- Previous studies have shown improvements in pain, physical functioning and sleep quality
- Recent guidelines recommend non-inhaled medical cannabis if standard care is not sufficient for symptom control in chronic, non-cancer pain

Playing-Related Musculoskeletal Disorders

Defined as: *pain, weakness, numbness, tingling or other symptoms that interfere with the ability to play the instrument at the level you are accustomed to.*

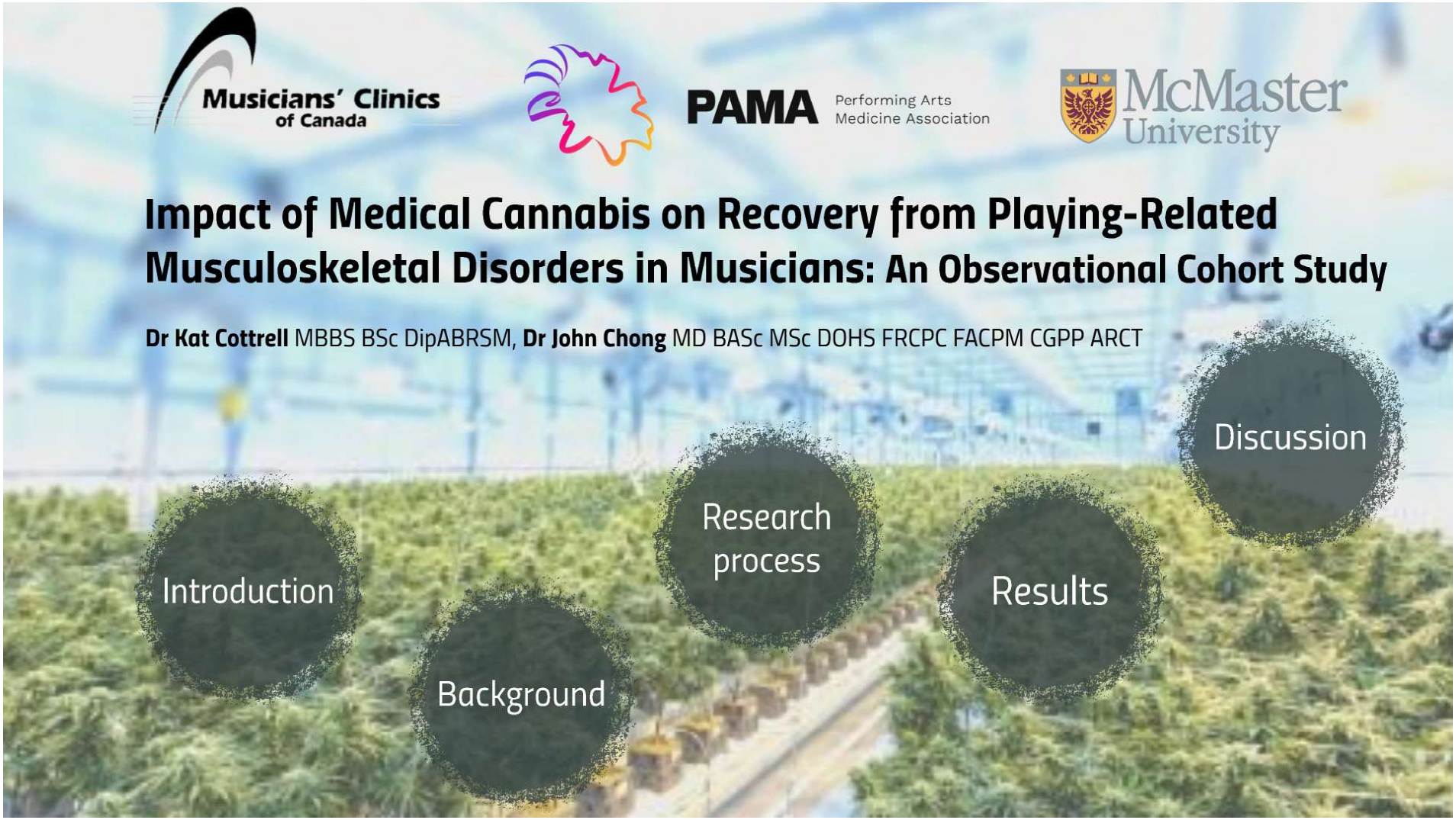
Musicians have an **84% lifetime prevalence** of PRMD

Musicians' Clinics of Canada

- **OHIP funded clinic** that receives referrals for musicians with a host of different health conditions.

- **Musicians are particularly at risk**:
  Long practice hours, unstable work, low income, high stress, make-it-or-break it culture, shame/stigma around injuries, late nights/lack of sleep, poor nutrition on tour, ++ substance use culture

- **Interventions** at the clinic include:
  Biofeedback, surface EMG, motion analysis, heart rate variability and neurofeedback, lifestyle interventions, psychotherapy, and pharmacological management, including medical cannabis, where appropriate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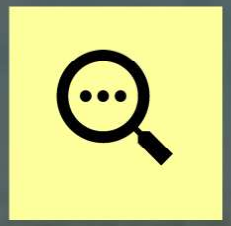
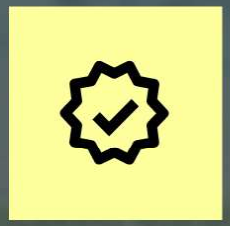
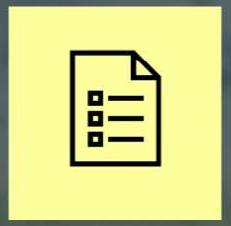
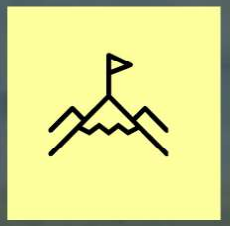
The Research Journey

Methods

- Retrospective cohort study
- Compared:
  - New medical cannabis users
  - Long-term medical cannabis users
  - Non medical cannabis users
- Outcomes:
  - Musculoskeletal Pain Intensity and Interference Questionnaire for Musicians (MPIIQM)
  - DASS-21

Ethics

- Granted Hamilton Integrated Research Ethics Board (HiREB) approval
- Gathered consent from pts via email

Data Collection

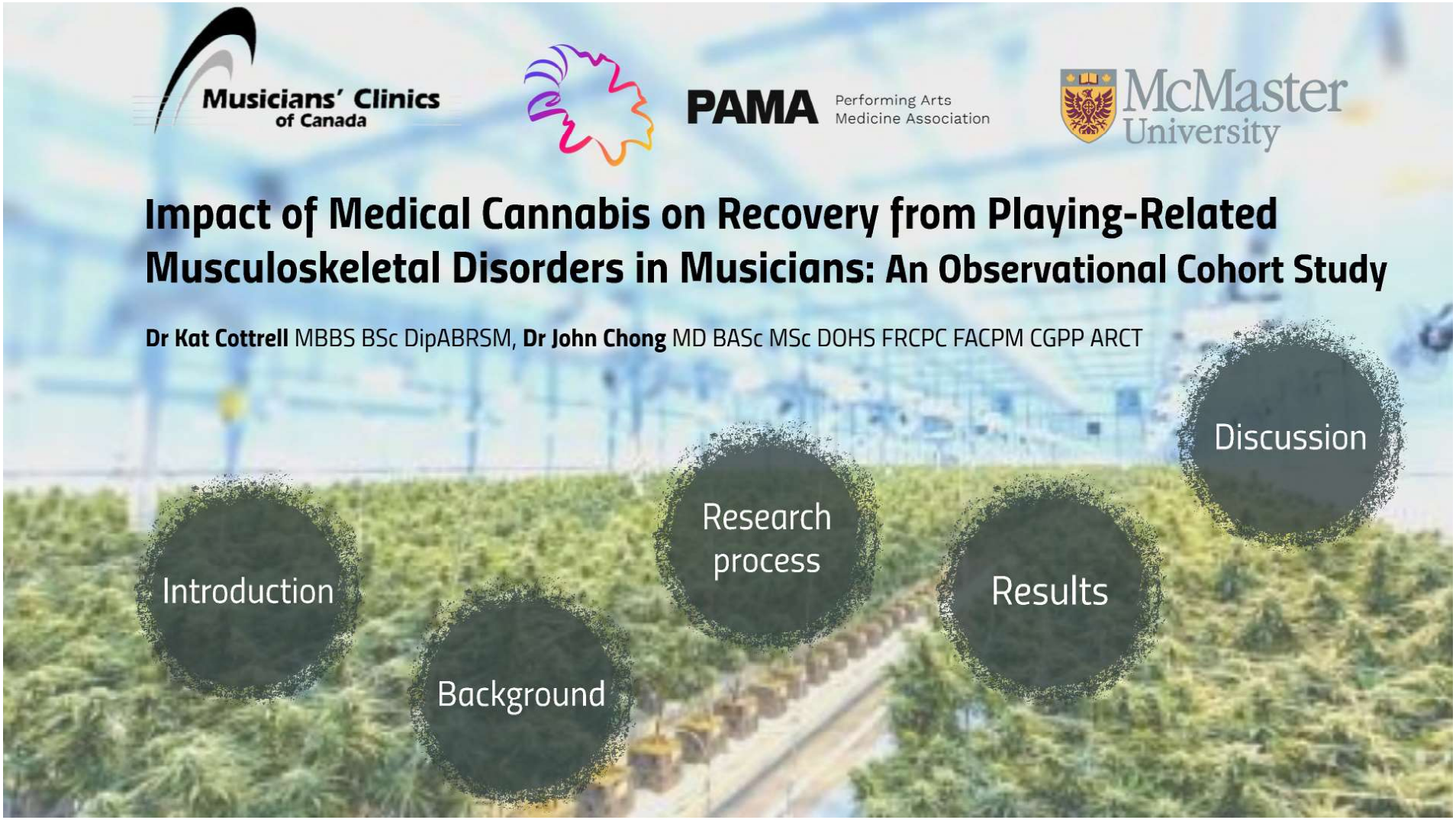
The 204 eligible study participants were split into 3 groups:

- '**Non-cannabis users**' who declined medical cannabis (42)
- '**New medical cannabis users**' with baseline questionnaire data (61)
- '**Long-term medical cannabis users**' without baseline questionnaire data prior to starting medical cannabis (101)

Questionnaire data from pts first visit in the study period, and a subsequent visit six-months later were collected

Analysis

- Completed using SPSS
- Chi-squared tests for demographic data
- Paired t-tests to compare within group differences
- ANOVA to compare between group differences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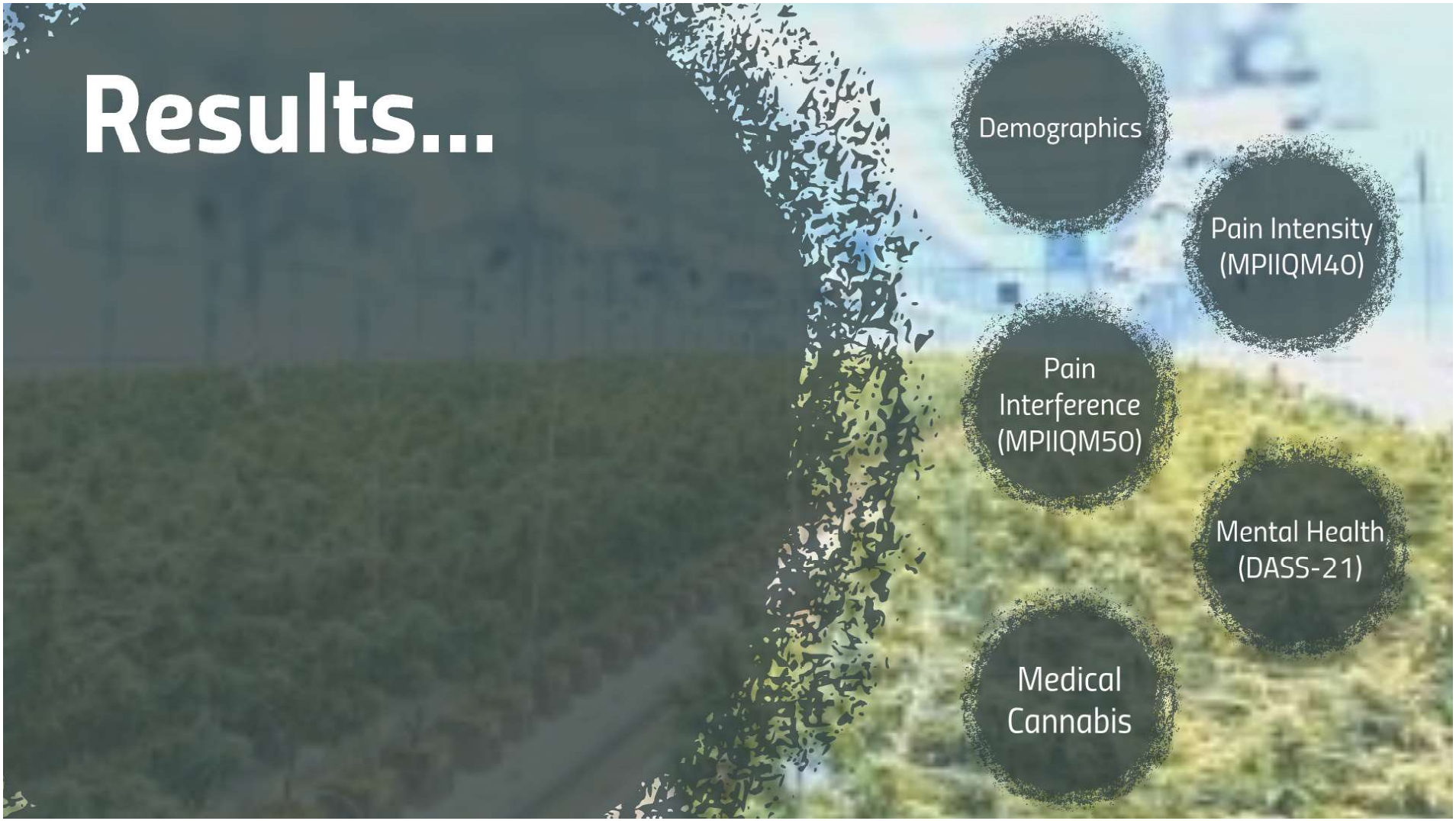

Results...
Demographics
Pain Intensity (MPIIQM40)
Pain Interference (MPIIQM50)
Mental Health (DASS-21)
Medical Cannabis

Demographic data shows no significant difference between groups

Patient characteristics at baseline				
	Non-Cannabis Users	New Cannabis Users	Long-term Cannabis users	*p* value
Count	42	61	101	
Age (years)	51 ± 16.5	47 ± 17.0	50 ± 13.7	.297
Sex (M)	29 (69%)	44 (72%)	78 (77%)	.551
Adverse Childhood Experiences (0 – 10)	2 ± 2.04	2 ± 2.03	2 ± 1.94	.961
On other analgesia (Y)	10 (24%)	12 (20%)	25 (25%)	.752

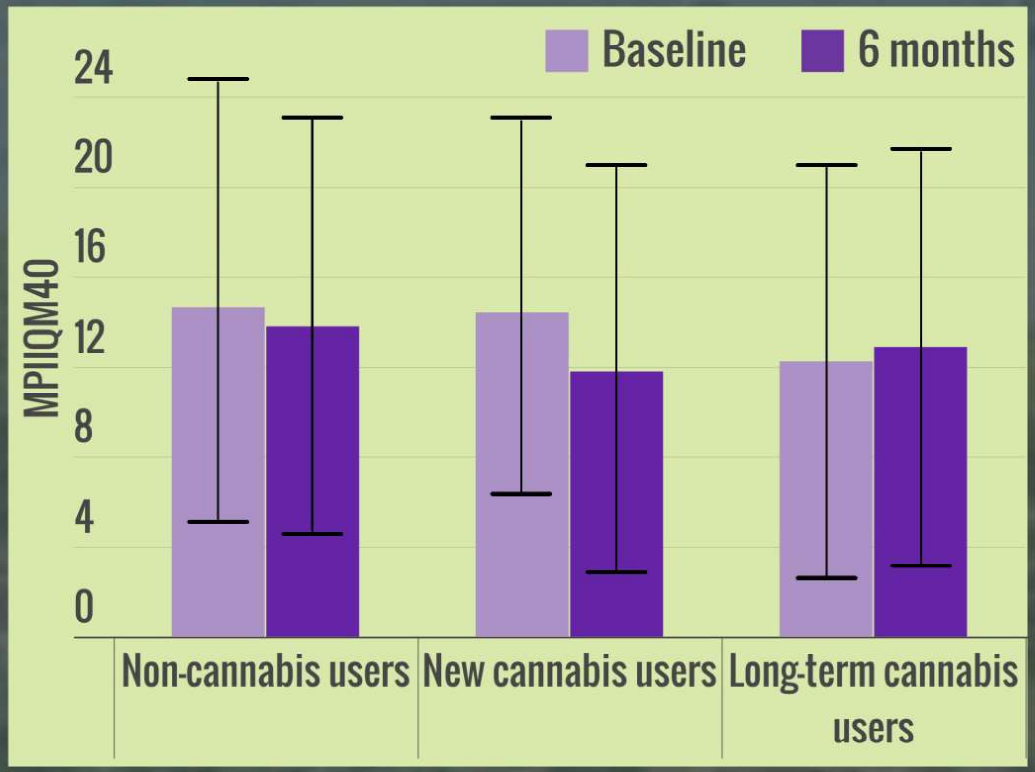
Data are mean ± standard deviation

Pain Intensity: MPIIQM40

New cannabis users had a **significant reduction in pain intensity** (p=.002) at six-months.

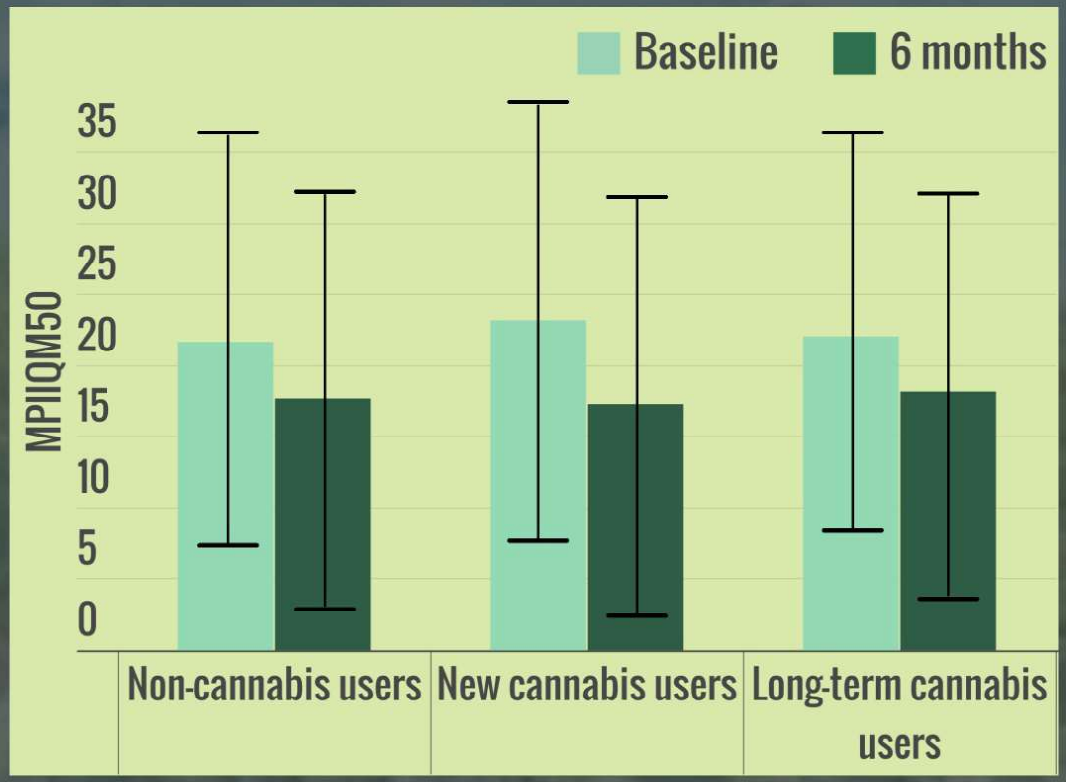
A **significant difference** in pain intensity was shown for **new vs long**-term cannabis users (p=.023) at six-months.

Cannabis acts on **CB2 receptors** to **modulate the response to pain**, reducing pain **sensitivity** by reducing **neuroinflammation** through the microglia



Pain Interference: MPIIQM50

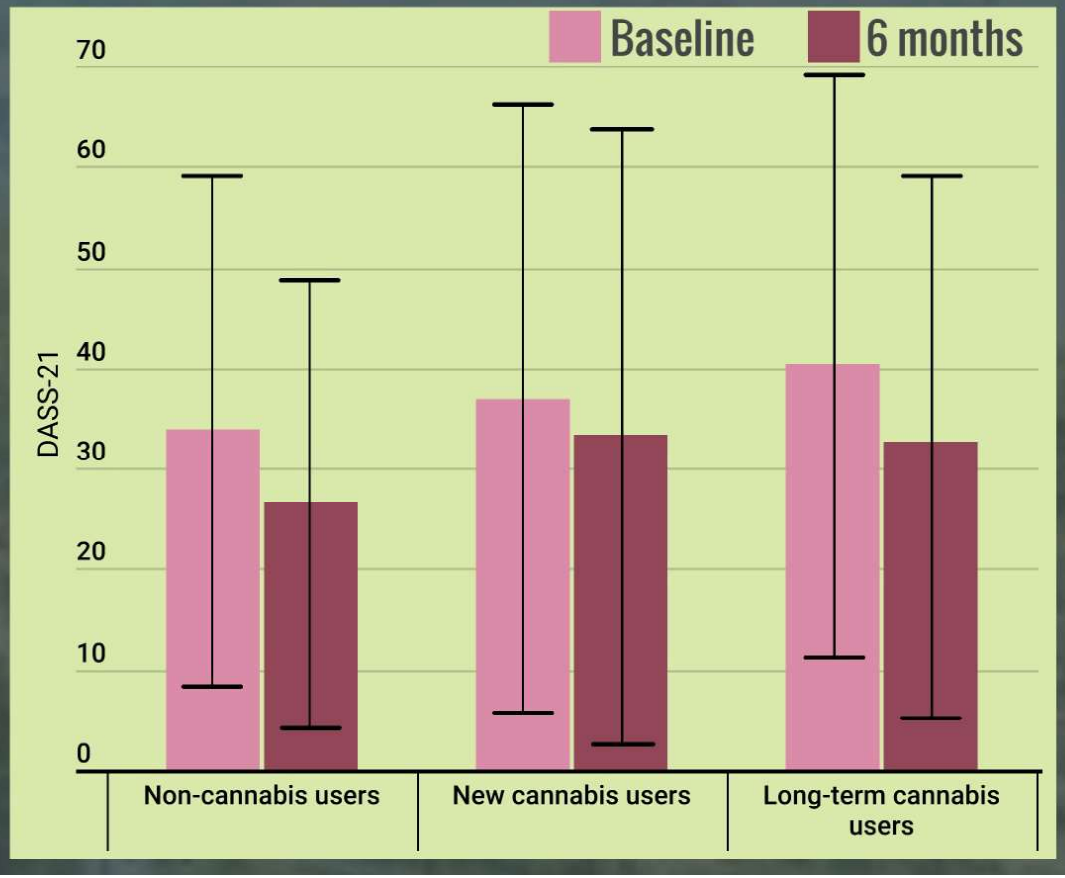
Non-users (p=.035), **new users** (p=.002) and **long-term cannabis users** (p=.009) all had **significant reductions** in **pain interference** at six-months.



Mental Health: DASS-21

Non-cannabis users (p=.003) and **long-term cannabis users** (p=.001) had **improvements in DASS-21** scores at six-months.

CB1 receptors are involved in the **acute stress/anxiety response.** CBD may contribute to an **attenuation** of the **acute autonomic response** associated with stress, and acts indirectly through **serotonin pathways** for **anti-depressant** and **prohedonic effects**.



Dosage of CBD/THC

Daily Medical Cannabis dose at six-months:

New users:	Long-term users:
CBD: 24.87 ± 12.86mg	CBD: 23.39 ± 15.60mg
THC: 2.11 ± 1.45mg	THC: 4.41 ± 5.18mg

Summary:

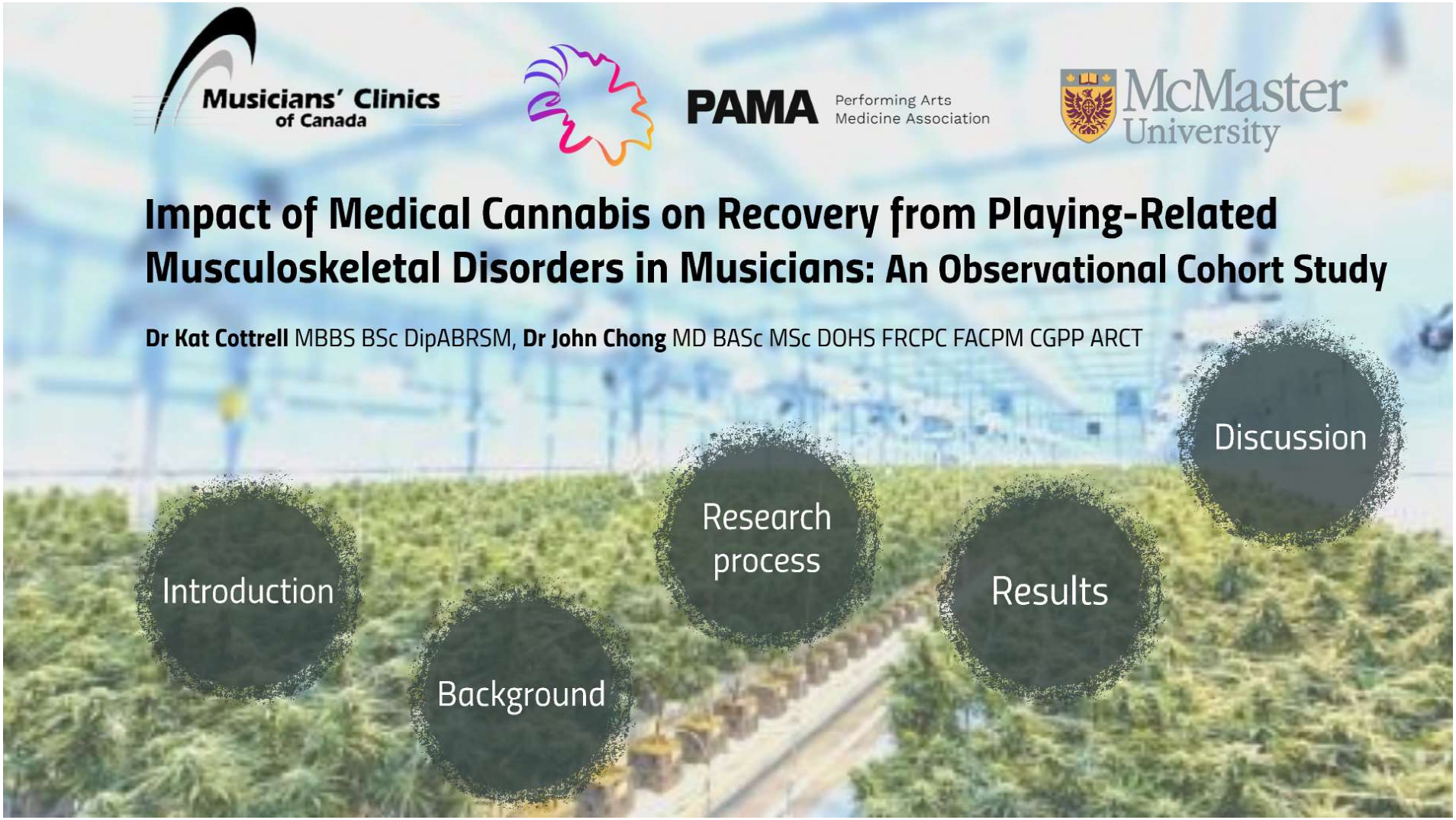
- **No sig change** in dosage for CBD/THC in **LONG-TERM users** over the 6m period ($p > 0.05$)
- **No sig difference in CBD dose** between the new users and long-term users at six-months ($p = .579$)
- **Long-term users** did use a sig **higher dose of THC** compared to new users at six-months ($p = .003$)
- CBD/THC dosing were **within guideline recommendations**

Adverse Events


No serious adverse events from medical cannabis
Tiredness
Overeating
Cough/Dry mouth
Mild cognitive impairment
Formal qualitative analysis of subjective symptoms planned

Results...

- No sig difference in demographics at baseline
- New users had a significant reduction in **pain intensity** at six-months
- **All groups** had significant reductions in **pain interference** at six-months
- **Non-users** and **long-term** users had significant improvements **DASS-21** scores at 6m
- No serious adverse events experienced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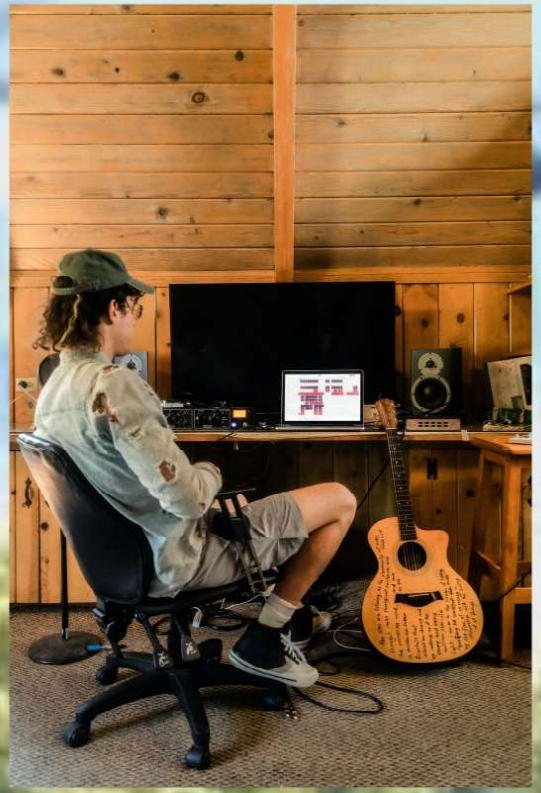
Conclusions

- **Multidimensional model of care** led to improvements in symptoms for **all groups**
- The significant impact of medical cannabis for **new users** was in the experience of **pain intensity**
- Medical cannabis seems to be a relatively **safe treatment** in this group over a six-month period

Discussion
Limitations
Poster
References

Discussion

- Medical cannabis may be a good option to **decrease pain intensity** in PRMD
- Likely a **safer alternative** to opioids, esp in this population
  - >2,000 opioid related deaths a year in Canada
- **Further studies required** to determine long-term results and adverse events
- **Barriers to use** remain:
  - Lack of physician training, price for pts ($4.50/day), travel restrictions...
- **Non-pharmacological** management options remain important
  - In keeping with American College of Physicians, Canadian Guidelines for non-cancer pain and International Olympic Committee on pain management
- A **personalized approach** to care is key



Limitations

- Pts **self-selected** whether to add medical cannabis to their treatment plan
  - Pt decision may be based upon differences in previous treatments? Impact of PRMD on QOL? Cost?
- Sig differences in **group sizes**
- **Subjective** outcomes
- Difficulty ensuring proper **dosage** reporting due to oil-based cannabis

BUT this **practice-based evidence** reflects **clinical reality**, and conducting RCTs with medical cannabis is challenging

Impact of Medical Cannabis on Recovery from Playing - Related Musculoskeletal Disorders in Musicians: An Observational Cohort Study

McMaster University

Musicians' Clinics of Canada

Dr Kat Cottrell MBBS BSc DipABRSM, Dr John Chong MD BASc MSc DOHS FRCPC FACPM CGPP ARCT

Background

- Playing-related musculoskeletal disorders (PRMD) are 'pain, weakness, numbness, tingling or other symptom that interferes with the ability to play the instrument at the level you are accustomed to' [1]
- PRMD can affect musicians' ability to work, their mental health and sense of self [2]
- Musicians have an 84% lifetime prevalence of PRMD [3]
- Many types of analgesia are inappropriate for this population [4, 5, 6, 7]
- Cannabidiol (CBD) has been shown to have anti-inflammatory, neuroprotective properties, improve sleep and physical functioning, and reduce perception of pain [8,9]
- Medical cannabis has been shown to be safer than other analgesia in terms of serious adverse events [10]

STUDY AIM: To explore the impact and safety of medical cannabis for PRMD

Methods

Musicians' Clinics of Canada Routine PRMD Care

Treatment includes biofeedback, psychotherapy and lifestyle interventions. PRMD patients are offered medical cannabis as part of their treatment plan. Questionnaires are completed by patients before each visit:

- The Musculoskeletal Pain Intensity and Interference Questionnaire for Musicians (MPIIQM) [11]
  - MPIIQM40 for pain intensity
  - MPIIQM50 for pain interference
- The Depression, Anxiety and Stress Scale (DASS-21) [12]
- Questionnaire on medical cannabis dosing, positive and negative effects

Retrospective Observational Cohort Study

- McMaster HiREB approval: May 2021
- Consent obtained from patients who attended the clinic between Jan 2019 and Jan 2020, >18 years old with PRMD

Data Collection

- The 204 eligible study participants were split into 3 groups:
  - 'Non-cannabis users' who declined medical cannabis (42)
  - 'New medical cannabis users' with baseline questionnaire data (61)
  - 'Long-term medical cannabis users' without baseline questionnaire data prior to starting medical cannabis (101)
- Questionnaire data from participants' first visit in the study period, and a subsequent visit six-months later were collected

Data Analysis

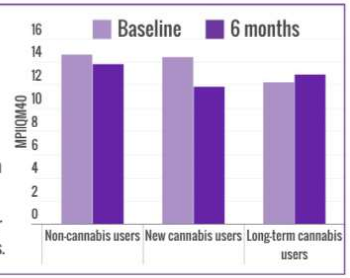
- Baseline and six-month data were compared within each group using paired t-tests
- Between group differences were assessed using ANOVA

Results

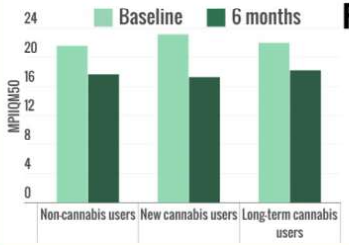
Pain Intensity (MPIIQM40)

New cannabis users had a **significant reduction in pain intensity** ($p_{=}.002$) at six-months.

A **significant difference** in **pain intensity** was shown for new vs long-term cannabis users ($p_{=}.023$) at six-months.



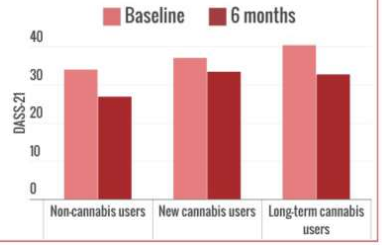
Pain Interference (MPIIQM50)



Non-users ($p_{=}.035$), **new users** ($p_{=}.002$) and **long-term cannabis users** ($p_{=}.009$) all had **significant reductions in pain interference** at six-months.

Mental Health (DASS-21)

Non-cannabis users ($p_{=}.003$) and **long-term cannabis users** ($p_{=}.001$) had **improvements in DASS-21** scores at six-months.



Medical Cannabis

Daily Medical Cannabis dose at six-months:

New users:		Long-term users:	
CBD:	24.87 ± 12.86mg	CBD:	23.39 ± 15.60mg
THC:	2.11 ± 1.45mg	THC:	4.41 ± 5.18mg

Reported side effects:

Increased appetite, Tiredness, Cognitive effects, Dry mouth

Discussion

Impact of Medical Cannabis on PRMD

- Medical cannabis significantly reduced pain intensity in new users of medical cannabis with PRMD
- All groups saw improvements in pain interference at six-months
- In keeping with prior studies, medical cannabis seems to be effective at reducing perceptions of pain, including PRMD
- This practice-based evidence demonstrates that a multidimensional approach to care benefits patients' experience of pain as well as their mental health

Safety of Medical Cannabis

- CBD/THC dosing were within guideline recommendations [8]
- No patients experienced any serious adverse events, in keeping with previous studies [10]

Limitations

- Multiple factors impacting patients' decisions to opt in or out of medical cannabis
  - For example cost of medical cannabis, comorbidities and disease chronicity

Further Questions

- Future qualitative studies are planned to explore the subjective positive and negative effects of medical cannabis in musicians
- Further studies are required to explore the long-term impacts of medical cannabis for PRMD, ideally as a randomized controlled trial

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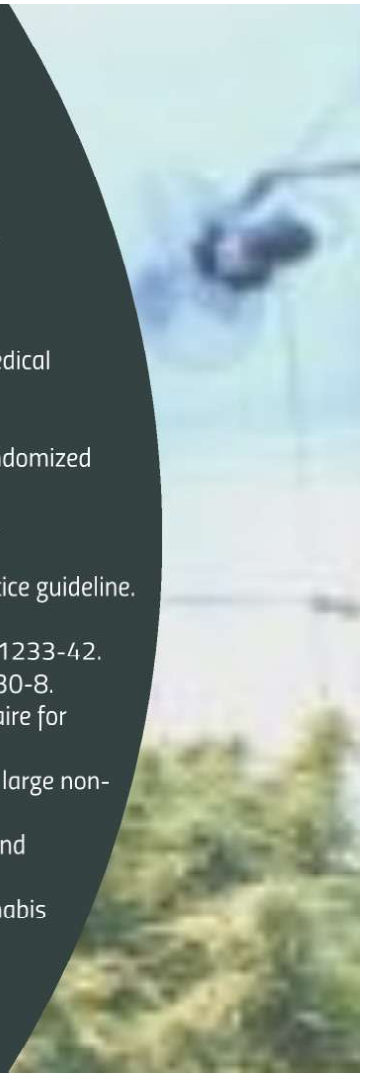

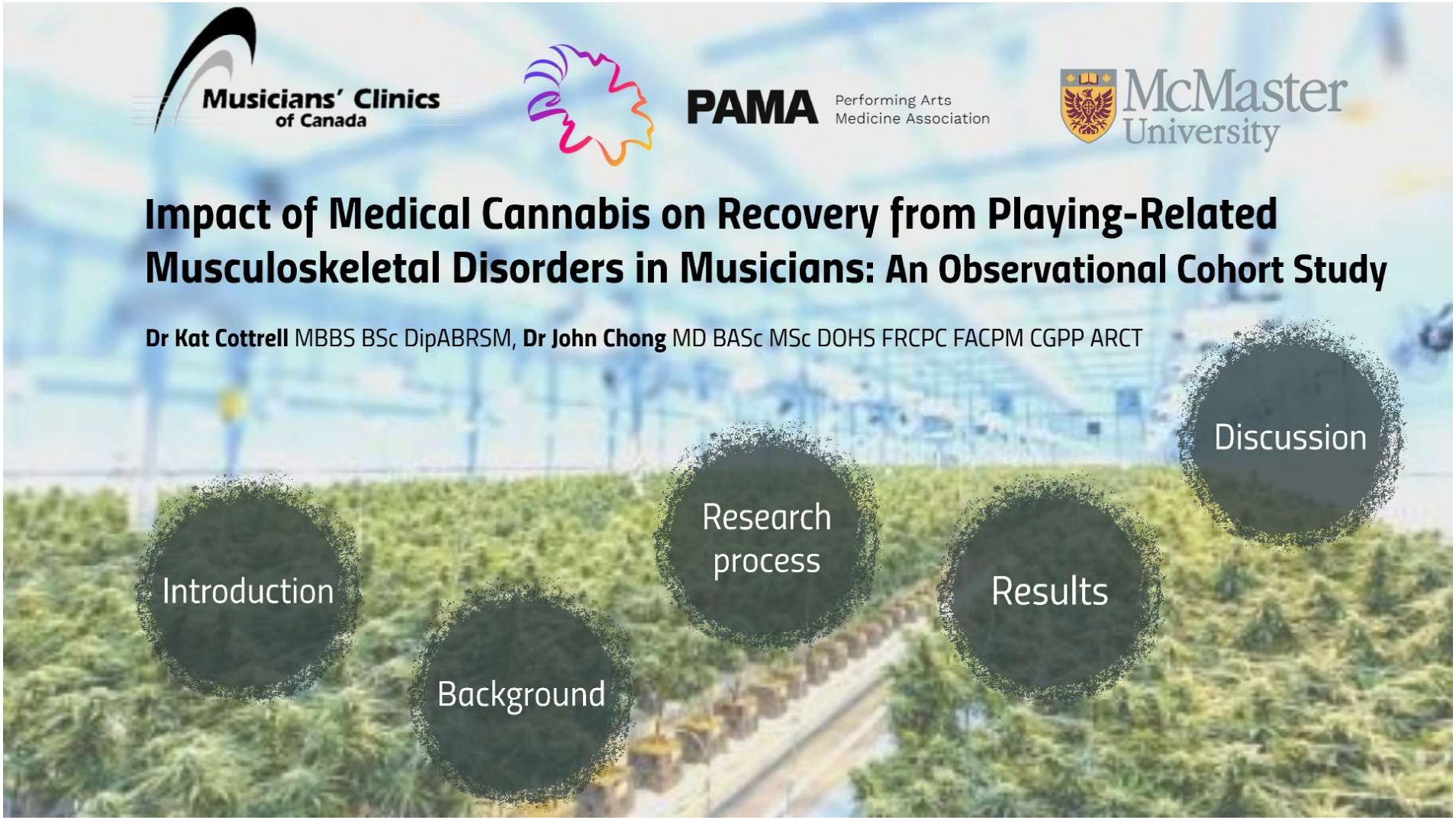
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