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# Team Grant: Cannabis Research in Priority Areas

## 2024 PROGRESS SUMMARY

Also available on the Web in PDF and HTML formats

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# Introduction

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## OVERVIEW

In 2019, CIHR launched the *Team Grant: Cannabis Research in Priority Areas* funding opportunity to explore in more detail the potential therapeutic benefits and harms associated with cannabis use in several targeted areas identified through previous consultations. The funding supported projects relevant to research areas including cancer, cardio-respiratory/sleep, neurodevelopment, Indigenous Peoples' health, pain, arthritis pain, mental health, multiple sclerosis, and Veterans' health. This funding opportunity is expected to strengthen the evidence base and to build cannabis-related research capacity.

These projects were funded for five years, beginning in 2020 and funded teams have provided an update on their research findings for the fourth year of their grants, which are summarized below.

This funding opportunity received support from the *Institute of Neurosciences, Mental Health and Addiction (INMHA)*, *Institute of Cancer Research (ICR)*, *Institute of Circulatory and Respiratory Health (ICRH)*, *Institute of Human Development, Child and Youth Health (IHDCYH)*, *Institute of Indigenous Peoples' Health (IIPH)*, *Institute of Musculoskeletal Health and Arthritis (IMHA)* and the *Arthritis Society of Canada*, *Canadian Cancer Society*, *Mental Health Commission of Canada*, *MS Canada*, and *Veterans Affairs Canada*.

## DISCLAIMER

This progress report includes selected key outcomes as reported by 12 of the 14 teams, covering the period from March 2023 to April 2024. Project summaries and key outcomes have been edited for length and clarity. Any errors or omissions are unintentional. This progress report should not be taken as a definitive account of interim research findings. Readers are advised to follow up directly with grant recipients for the most current information on their projects.

# Projects

## CANNABIS FOR MEDICAL PURPOSES AND CHRONIC CANCER AND NON-CANCER PAIN: AN EVIDENCE-BASED CLINICAL PRACTICE GUIDELINE

*Nominated Principal Investigator: Jason W. Busse, McMaster University*

This project aims to develop an evidence-based clinical practice guideline for using medical cannabis in managing chronic pain. Providing access to evidence-based recommendations on the safety and effectiveness of cannabis for chronic pain will benefit health care providers, policy makers, and patients, especially older Canadians, Indigenous populations, and Veterans, who are disproportionately affected by chronic pain.

Key outcomes during this reporting period include:

- The team **developed and distributed a survey** to gather feedback on the final recommendations regarding the guideline's prioritized questions from people with lived and living experience, health care professionals and researchers.
- The team **held meetings with key decision makers** from Veterans Affairs Canada, Health Canada and the Arthritis Society of Canada to discuss the appropriate use of cannabis for chronic pain, identify research gaps, and plan for future funding opportunities, as well as strategies to influence policies such as the *Cannabis Act*.

*Learn more about this project.*

## CANNABINOID-BASED PRECISION MEDICINE FOR OSTEOARTHRITIS THERAPY

*Nominated Principal Investigator: Hance A. Clarke, University Health Network*

This team is developing a precision medicine approach to cannabis-based therapy for osteoarthritis (OA) using patient and animal studies. The information could provide an evidence base for the appropriate therapeutic use of cannabinoids for OA management.

Key outcomes from the reporting period include:

- The patient study is looking for biomarkers to predict how well someone will respond to cannabis. The study has **219 patients participating**, including 45 cannabis users and 174 non-users.
- Results show that **patients use many different types of cannabis products for pain relief**.
- Findings from studies using animal models suggest that **THC might help reduce pain in OA**. Evidence suggests it works best when taken by mouth over time. THC may change how nerve cells in joints function.

*Learn more about this project.*

## CANADIAN CANNABIS AND PSYCHOSIS RESEARCH TEAM

*Nominated Principal Investigator: Patricia Conrod, CHU Sainte-Justine*

This team supports coordinated translational research (from animal models to humans) on the effects of cannabis on adolescent brain development and the relationship between adolescent cannabis use and psychosis risk. Participants will benefit from data pooling activities and the translational research framework, producing valuable data and knowledge for the public, with particular relevance to the clinical networks represented within the team (e.g., Canadian Consortium on Early Intervention on Psychosis).

Key outcomes from the reporting period include:

- **Young males are more sensitive** to certain effects of cannabis on brain development, and adolescent-onset cannabis use and high-potency cannabis have been linked to the development of psychotic disorders in young adults.
- **Animal studies** are identifying which brain cells are most impacted by adolescent cannabis use, and are highlighting sex-specific differences in how adolescent cannabis exposure affects the development of impulse control and related systems in the brain.
- **Published studies** demonstrate that anxiety *plays a significant role in the connection* between cannabis use and psychosis-like experiences in young adults, with further analyses being conducted in teens and young adults.

*Learn more about this project.*

## PAN-CANADIAN NETWORK TO INVESTIGATE CANNABIS USE IN PREGNANCY AND NEURODEVELOPMENTAL OUTCOMES IN CHILDREN

*Nominated Principal Investigator: Daniel J. Corsi, CHEO Research Institute*

This project assesses the likelihood of developmental impairments in children resulting from perinatal (before and after birth) cannabis exposure. Findings will improve the sharing of knowledge around cannabis use in pregnancy and contribute to better care and outcomes for infants, families and Canadian society.

Key outcomes for the reporting period include:

- The team **increased the recruitment** rate for the pilot birth cohort study by 65% from the previous year. They completed a **qualitative study** including interviews with patients and health care providers.
- Analyses for **cannabis biomarkers** from an older cohort were completed, and the team received supplemental funding to link the cohort to health records in Ontario.
- Progress has also been made on establishing a **patient advisory group**.
- Analyses of **social media posts** about cannabis use in pregnancy were completed, and results will be shared in the next report.

*Learn more about this project.*

## A PROSPECTIVE TRANSLATIONAL MODEL OF THE THERAPEUTIC POTENTIAL OF CANNABIDIOL IN REDUCING ACUTE PAIN SYMPTOMS AND OPIOID USAGE FOLLOWING TRAUMATIC INJURY

*Nominated Principal Investigator: Louis De Beaumont, University of Montreal*

This project utilizes a translational model (animals to humans) to explore the effectiveness of cannabidiol (CBD) in reducing pain and minimizing the need for opioids following a traumatic injury.

Key outcomes during the reporting period include:

- A **randomized clinical trial** investigating the use of CBD for alleviating pain symptoms in trauma patients is ongoing. This study is part of a research collaboration with Empowerpharm Inc., a Canadian-based company.
- An animal experiment has been completed, and the team **is revising a manuscript on the therapeutic potential of CBD** for relieving pain and inflammation in mice after an injury.

- A study examining the administration of different amounts of CBD in rodents is underway to **examine sex differences in the reduction of pain symptoms** following a traumatic injury.

*Learn more about this project.*

## **EFFICACY OF CANNABINOIDS COMPARED TO THE CURRENT STANDARD TREATMENTS ON SYMPTOM RELIEF IN PERSONS WITH MULTIPLE SCLEROSIS (PWMS): RANDOMIZED CONTROLLED TRIAL (CANSEP STUDY)**

*Nominated Principal Investigator: Pierre Duquette, University of Montreal*

This project evaluates the effectiveness of cannabinoids in enhancing symptom relief for persons with multiple sclerosis (PwMS). Findings will improve knowledge about the use of cannabis to manage MS symptoms, as well as its effects on cognition, mental health and addiction risk, and may lead to improved quality of life for PwMS.

Key outcomes during the reporting period include:

- **Recruitment is ongoing**, with 41 out of 200 planned participants having been randomized to date.
- **There are updates on two ancillary studies:** data collection for the PERSPECTIVE study (a pan-Canadian survey on the perception of PwMS regarding therapeutic cannabis) is complete, and data analysis is underway. The EXPECT study (which involves interviews with CANSEP participants about their experience in the trial) has surpassed 90% participation, with both initial and mid-term interviews completed.
- **Key recommendations** from the first Data and Safety Monitoring Board meeting include improving recruitment strategies and creating a new form to track THC or CBD doses during medication changes to assess tolerability for managing spasticity.

*Learn more about this project.*

## **MATERNAL-INFANT DYAD OUTCOMES: INFANT NEURODEVELOPMENT IN THE CONTEXT OF MATERNAL CANNABIS USE – A PROSPECTIVE COHORT STUDY**

*Nominated Principal Investigator: Matthew S. Hicks, University of Alberta*

This project investigates the relationship between cannabis exposure and early neurodevelopmental outcomes. The findings will offer valuable insights to help families make informed decisions about cannabis use and lay the groundwork for future research on the long-term effects of cannabis exposure on children.

Key outcomes from the reporting period include:

- The team has been actively **recruiting study participants and has added new team members** to help manage the growing number of participants.
- The team has begun **tracking child development** using a standard questionnaire and is preparing for more detailed assessments when the children reach 18 months of age.
- The team is **analyzing the questionnaire responses** to gain insights into the participants and their exposure to different factors, as well as reviewing air quality data with expert help. They are also testing samples of maternal urine and breast milk to study the levels of different substances.

*Learn more about this project.*

## ADOLESCENT CANNABIS EXPOSURE, BRAIN DEVELOPMENT AND COGNITIVE-EMOTIONAL BEHAVIOURAL OUTCOMES: INFLUENCE OF LIFE STRESS

*Nominated Principal Investigator: Matthew N. Hill, University of Calgary*

This project examines the impact of varying patterns of cannabis exposure during adolescence on brain development and behavioural outcomes in rats. The studies will help to establish whether there may be harms associated with cannabis use during adolescence on the development of mental illness.

Key outcomes during the reporting period include:

- Rats were exposed to cannabis vapor either once a week, once a day, or multiple times a day during adolescence. Multiple daily exposures led to **increased growth in the frontal cortex** (the area of the brain responsible for complex and deliberate thought processes like decision-making), while less frequent exposures resulted in reduced growth in several subcortical brain regions (areas responsible for more automatic processes such as emotion, memory, hormone regulation and motor control).
- Rats exposed to cannabis either weekly or daily showed a **behavioural pattern of reduced anxiety and increased impulsivity**.
- In a study involving teenagers, researchers found that **early cannabis use was linked to externalizing symptoms resembling those seen in ADHD** (attention-deficit/hyperactivity disorder).

*Learn more about this project.*

## CANNABIS FOR SYMPTOM MANAGEMENT IN CHILDREN WITH CANCER: A DEMONSTRATION PROJECT BY THE CANADIAN CHILDHOOD CANNABINOID CLINICAL TRIALS (C4T) PLATFORM

*Nominated Principal Investigator: Lauren Kelly, University of Manitoba*

*The Canadian Collaborative for Childhood Cannabinoid Therapeutics (C4T) team gathers evidence and provides information on the safety and effectiveness of cannabis products in children with cancer to better understand the risks and potential benefits of medical cannabis use in this population.*

Key outcomes from the reporting period include:

- The team held **monthly meetings** open to all C4T members, regular multidisciplinary steering committee meetings, and maintained **ongoing engagement** with partner organizations and patient partners. The C4T network grew from 106 to 115 members this year.
- The **team launched an observational study** on medical cannabis in children, with recruitment still ongoing. They also obtained ethics and Health Canada approvals to begin a clinical trial on medical cannabis for cancer symptom management.
- The team **published** four peer-reviewed articles, including *co-designing clinical trials alongside youth with chronic pain, systemic review and meta-analysis*, **established a pediatric cannabis special interest group**, and held its first meeting at an **international conference**, which included participation from scientists, clinicians, researchers, parents, and youth.

*Learn more about this project.*

## THE CANADIAN USERS OF CANNABIS SMOKE STUDY (CANUCK)

*Nominated Principal Investigator: Janice Leung, University of British Columbia*

This project investigates the long-term effects of cannabis smoking on the lungs at multiple levels, including health outcomes, breathing tests, imaging, and airway cells. Findings will inform Canadians and health care providers about the health risks of cannabis smoking, and guide policy makers and health economists in assessing its burden on the Canadian health care system.

Key outcomes from the reporting period include:

- A total of **222 participants have been enrolled** in the study. To date, 133 chest CT scans, 128 MRI scans, and 55 bronchoscopies have been performed.
- Cells from participants who smoke and do not smoke cannabis **are being used to identify gene changes** related to cancer and asthma pathways.
- Participants who **smoke cannabis continue to show greater respiratory symptoms** compared to those who do not smoke.

*Learn more about this project.*

## SYSTEMATIC PRECLINICAL EVALUATION OF CANNABINOID INFLUENCES ON SLEEP AND BREATHING

*Nominated Principal Investigator: Silvia Pagliardini, University of Alberta*

This project examines which, and how, cannabinoids affect sleep and breathing to evaluate their potential therapeutic benefits and harms in animal models. The findings will enhance our understanding of the risks and benefits of cannabis on sleep and respiratory functions during development and adulthood, and contribute evidence on the potential long-term risks to a developing fetus.

Key outcomes for the reporting period include:

- Preliminary studies indicate that **THC reduces wakefulness and increases the amount of time spent in deep sleep** (NREM). Breathing is not disrupted, although respiratory rate decreases during NREM.
- THC changes brain wave activity in the cortex and hippocampus, **increasing slow brain waves in the cortex** and decreasing specific brain waves in the hippocampus. It also enhances the coordination between these brain regions.
- **Prenatal exposure to THC leads to more frequent sleep bouts** in newborn rats (day 1) and less wakefulness on days 2 and 3. This suggests a sedative effect and possible suppression of arousal systems. It also causes increased variability in breathing patterns, indicating potential issues with respiratory control.

*Learn more about this project.*

## THE IMPACT OF CANNABIS LEGALIZATION ON THE FORENSIC MENTAL HEALTH PATIENT POPULATION IN ONTARIO

*Nominated Principal Investigator: Stephanie Penney, Centre for Addiction and Mental Health*

This project investigates the potential harms and health-related impacts of cannabis legalization on users of forensic mental health services in Ontario. The team's findings will bring new knowledge in terms of assessment of risks and benefits of cannabis and its components.

Key outcomes during the reporting period include:

- The team completed qualitative **data collection** with three primary partner groups: forensic mental health service users, forensic clinicians, and members of the Ontario Review Board.
- A **manuscript** containing the primary quantitative results was submitted to the *International Journal of Drug Policy* for publication and is currently under review.
- **Knowledge mobilization activities** included presenting the *study's results* at the International Association of Forensic Mental Health Services (IAFMHS), sharing the full results at hospital grand rounds, and delivering a keynote address at a provincial conference focused on forensic and correctional mental health based on study results.

*Learn more about this project.*

## FOR MORE INFORMATION

A summary from the *Cannabis Research in Priority Areas Virtual Progress Workshop held in November 2022 is available online*. The meeting book for the workshop is available to the public upon request. Requests can be directed to the CIHR Contact Centre: [support-soutien@cihr-irsc.gc.ca](mailto:support-soutien@cihr-irsc.gc.ca).

More information on the CIHR's Integrated Cannabis Research Strategy can be found at <https://cihr-irsc.gc.ca/e/50932.html>.

For more information on CIHR's Institute of Neurosciences, Mental Health and Addiction, visit: <https://cihr-irsc.gc.ca/e/8602.html> or email [INMHA-INSMT@cihr-irsc.gc.ca](mailto:INMHA-INSMT@cihr-irsc.gc.ca).