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# UOJM: PREFACE

The University of Ottawa Department of Psychiatry virtually hosted its annual Research Day on November 17, 2021. This year's theme was Climate Change and Mental Health. The online event welcomed 168 registered individuals. Our sincere thanks to everyone who participated to make this event a success!

We were pleased to feature a keynote address by Dr. Sean Kidd, Senior Scientist and the Division Chief of Psychology at the Centre for Addiction and Mental Health (CAMH) and an Associate Professor in the University of Toronto Department of Psychiatry. His lecture explored the links between climate change, mental health and inequity through the lens of homelessness.

The keynote address was followed by a panel discussion further exploring the implications of global climate change for mental health with attention to issues specific to Canada and beyond, and the growing disparities generated by climate risks. Invited panelists included our keynote speaker Dr. Sean Kidd, Dr. Katie Hayes (Climate Change and Mental Health Researcher, Health Canada), Dr. Husein Moloo (Director of Planetary Health, Faculty of Medicine, University of Ottawa), and Dr. Nicole Redvers (Assistant Professor, Department of Family and Community Medicine, University of North Dakota). The panel was moderated by Dr. Simon Hatcher (Chair and Full Professor, Department of Psychiatry, University of Ottawa).

Nine oral presentations and 37 poster presentations shared by psychiatry residents, medical students, graduate students, and faculty members provided a snapshot of the ongoing research being conducted in the department. At the author's discretion, 17 abstracts have been published in the present conference proceeding.

We wish to congratulate the following award recipients at this year's event: Dr. Marc-Antoine Labelle (Best Resident Poster Presentation), Dr. Stephen Daniels (Best Postdoctoral Fellow/Student Poster Presentation) and medical students Eileen Huang and Chloe Ahluwalia (Best Oral Presentation).

Please enjoy this special issue of the University of Ottawa Journal of Medicine celebrating the diverse research portfolio of the University of Ottawa Department of Psychiatry.

Jennifer L. Phillips, Director of Research  
On behalf of The Organizing Committee  
University of Ottawa Department of Psychiatry

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## The role of stigma and reduced motivational salience in a survey study on cannabis use pre-post legalization in patients with schizophrenia

Jain, G.<sup>1,2</sup>, Zhand, N.<sup>1,2</sup>, Hatko, A.<sup>1</sup>, Stuyt, M.<sup>1</sup>, Robertson, C.<sup>1</sup>, Attwood, D.<sup>1,2</sup>

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### ABSTRACT

**Background:** Cannabis is the most commonly used illicit substance globally and the preferred substance among patients with schizophrenia. Cannabis use is not only associated with an increased risk of development of psychosis but also has detrimental effects on patients with schizophrenia.

**Method:** Surveys on cannabis use patterns pre- and post-legalization were conducted in our Schizophrenia Outpatient Program at the Royal Ottawa Mental Health Center. For the pre-legalization survey, patients were approached in the waiting room to participate in the study. Follow-up was conducted both at 8 weeks (second phase) and 12 months (long term) post-legalization.

**Results:** The initial survey response rate was approximately 40%. Of the initial 204 participants, 50.49% participated in the second phase and 17.1% in the long-term follow-up. Of the total participants, 69% were male and the mean age was 44.6 years. Lifetime cannabis use and cannabis use within the past year was reported as 53.5% and 25.9%, respectively. 87% of participants reported no change in their use on 8 week follow up. Long term follow-up surveys were completed primarily by non-users of cannabis (88.5%).

**Conclusions:** Stigmatization of cannabis use was commonly observed prior to its legalization in Canada, however, the question remains as to whether this remains the case post-legalization. The long term follow up survey of this study was completed mostly by non-users of cannabis (88.5%) which highlights 1) the stigma associated with cannabis use, despite legalization; 2) the potential synergistic effect of cannabis use in the schizophrenia population in reduced motivational salience; and 3) the limitations of conducting survey studies in this patient population.

### KEYWORDS

Cannabis, Motivational Salience, Stigma

### LEARNING OBJECTIVES

1. Discuss the result of a survey study on the impact of legalization of cannabis use among patients with schizophrenia
2. Describe motivational salience in schizophrenia and cannabis use, as well as the potential synergy when both disorders present
3. Explore the role of stigma towards users of cannabis, and how it can affect follow-up rates in research surveys

## The impact of psychiatry clerkship rotation on medical student attitudes towards psychiatry at the University of Ottawa: A pre- and post-survey

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### ABSTRACT

**Background:** While mental health illness is at an all-time high, the recruitment of psychiatrists remains an ongoing challenge. It is strategically important to predict whether medical students are graduating medical schools with the intention to fulfill the high demand for mental health services and to replace the current generation of psychiatrists, especially here in Ontario. We wanted to examine what factors motivate students to pursue Psychiatry as a career and what could possibly be done to increase interest in the field. Recruitment is such an important topic to focus on if we are to increase numbers of psychiatrists in the coming years and this all begins through their exposure in medical school. The objective of this study was to assess the change in medical students' attitudes towards psychiatry following their clerkship experience at the University of Ottawa during the 2020/21 academic year. A secondary objective was to see if the changes to the rotation brought forth by the pandemic had an impact on the students' attitudes.

**Method:** Ninety-seven medical students from the University of Ottawa were assessed pre-and post-their 2020/21 Psychiatry clerkship rotation using the validated ATP-30 (Attitudes Towards Psychiatry-30) measure. Cohorts of students were also then categorized as pre-COVID or during-COVID depending on when and how they experienced their clerkship. The total student response rate was approximately 48%. A quasi-experimental design was implemented, and non-parametric statistics were used to analyze the data.

**Results:** Medical students' overall attitudes towards psychiatry improved from pre-to-post clerkship. Although there were some significant differences in the experiences of the pre and during-COVID cohorts, we found that there was no significant impact on the magnitude to which attitudes improved.

**Conclusions:** The clerkship rotation in psychiatry is an important experience in medical school that plays a significant role in improving attitudes of medical students towards Psychiatry. Implementation of changes secondary to the COVID-19 pandemic did not have a negative impact on medical students' attitudes.

### KEYWORDS

Psychiatry, Clerkship, Medical Students

### LEARNING OBJECTIVES

1. Describe factors affecting attitudes of medical students towards Psychiatry.
2. Evaluate how the third year clerkship rotation in Psychiatry impacts medical students' attitudes towards psychiatry.
3. Evaluate the impact of the changes implemented to clerkship rotation due to the COVID-19 pandemic.

# Validation of smartphone-based cognitive assessments for patients with major depressive disorder

Therond, A.<sup>1</sup>, Mongeon, J.<sup>2,3</sup>, Shvets, C.<sup>3,4</sup>, Gu, F.<sup>3</sup>, Howard, A.<sup>2</sup>, Guimond, S.<sup>3,5,6,7</sup>

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## ABSTRACT

**Background:** Cognitive deficits are often present in patients with major depressive disorder (MDD). It remains challenging to assess these impairments in both clinical and research settings as little guidelines have been established around cognitive evaluations for those with MDD. Moreover, many hours are needed to train clinical assessors, and objective reports of cognitive deficits in MDD are often not correlated with subjective reports. Smartphone applications provide the opportunity to measure cognitive impairments in an accessible way as they are cost-effective, customizable, can be completed virtually anywhere and collect data in real-time

**Methods:** In this study, 24 individuals with MDD and 34 healthy controls (HC) completed the Trail Making Tests (TMT) A and B, and the smartphone-based versions, named the Jewels Trail Tests (JTT) parts A and B. On the TMT, Part A is a measure of processing speed, while Part B assesses executive functioning. In this study we aim to examine the validity and the reliability of the JTT A and B in assessing processing speed and executive functioning, respectively, similarly to the TMT. The Mini International Neuropsychiatric Interview (MINI) was used to confirm a diagnosis of MDD in the MDD group and confirm a healthy status in the HC group. The Montgomery-Asberg Depression Rating Scale (MADRS) was used to measure symptom severity in the patient group.

**Results:** Significant, positive relationships were observed between the JTT and TMT. Moderate, concurrent validity between the Parts A ( $r = .35$ ,  $p = .01$ ), and strong, concurrent validity between the Parts B ( $r = .58$ ,  $p = <.001$ ) were revealed in the analyses. The intraclass correlations (ICC) showed moderate test-retest reliability for Part A of the JTT (ICC = .57, CI [0.43, 0.71]) and good reliability for Part B (ICC = .76, CI [0.64, 0.85]). No significant differences were found in the cognitive performance scores between the MDD and HC groups for both cognitive tests.

**Conclusions:** This study presents a novel approach to assess cognition of MDD patients in a remote setting. Results indicate that both the pen-and-paper TMT and the smartphone-based JTT assessments correlate positively. The lack of differences in cognitive performances may not be representative of the MDD population due to self-selection bias, and that the size of the sample may have caused a lack of power. Finally, age was not perfectly matched between the two groups.

## KEYWORDS

Smartphones, Cognitive assessments, Depression

## LEARNING OBJECTIVES

1. Determine whether cognitive measures collected on the smartphone correlate to cognitive measures from the standard pen-and-paper trail tests.
2. Determine if the smartphone cognitive tests are sensitive and can detect cognitive impairments in people with depression.
3. Explore whether longitudinal cognitive measures collected every week on the smartphone using the JTT correlates with measures of self-reported sleep quality from a smartphone.



# Preliminary analysis of cardiac autonomic modulation across sleep state and levels of sleep depth in individuals with bipolar disorder and unipolar depression

Leveille, C.<sup>1,2</sup>, Saad, M.<sup>3</sup>, Brabant, D.<sup>1</sup>, Nikolitch, K.<sup>1</sup>, Bradley-Garcia, M.<sup>2</sup>, Robillard, R.<sup>1,2</sup>

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## ABSTRACT

**Background:** Autonomic nervous system dysfunctions and reduced heart rate variability have been reported in people with mood disorders. This study assessed heart rate and heart rate variability across wake and sleep stages in individuals with bipolar disorder compared to those with unipolar depression.

**Methods:** Secondary analyses were conducted on polysomnography with electrocardiography conducted in 180 patients referred to a specialized sleep clinic: 60 with bipolar disorder (70% female, mean age= 43.4 ± 11.6 years), 60 with unipolar depression (68.3% female, mean age= 43.2 ± 11.6 years), and 60 mentally healthy people (68.3% female, mean age= 43.4 ± 12.6 years). Heart rate and time-based heart rate variability parameters were computed on 30 second segments and averaged across the night for wake and sleep stages.

**Results:** Preliminary results observed a significant group by sleep state interaction for standard deviation of RR intervals (SDNN) ( $F(3.8, 312.0) = 2.6, p = .038$ ) and root mean sum of squared distance (RMSSD) ( $F(3.7, 310.4) = 2.8, p = .031$ ), but not heart rate. Compared to the control group, the unipolar group showed significantly reduced SDNN and RMSSD in NREM sleep (all,  $p \leq .001$ ) and REM sleep (all,  $p \leq .008$ ), but not during wake ( $p > .05$ ). SDNN was also significantly reduced in the bipolar groups compared to controls during REM sleep ( $p = .038$ ). Compared with controls, the unipolar group had significantly higher mean heart rate ( $p = .004$ ) and lower SDNN ( $p = .001$ ). They also exhibited significantly lower RMSSD during all NREM sleep ( $p \leq .001$ ), but not during wake ( $p = .060$ ).

**Conclusions:** Preliminary results suggest that autonomic dysfunctions tied to bipolar disorder are more prominent during sleep, especially REM, when compared to wake or NREM. Abnormalities in autonomic cardiovascular regulation associated with unipolar depression are more prominent in NREM sleep. Sleep may be a unique window through which autonomic dysfunctions tied to subtypes of mood disorders may be more clearly observable.

## KEYWORDS

Bipolar disorder, Cardiovascular regulation, Sleep

## LEARNING OBJECTIVES

1. Compare heart rate and heart rate variability parameters across sleep states (wake, NREM sleep, and REM sleep) in individuals with bipolar disorder and unipolar depression.
2. Assess autonomic cardiovascular regulation across the progression of NREM sleep depth (wake, NREM1, NREM2, NREM3) in individuals with bipolar disorder and unipolar depression.
3. Better understand the potential impacts of sleep dysfunction tied to bipolar disorder and their cardiovascular health.

## Client experiences with virtual care in early psychosis programs, a mixed-methods design

Bardell, A.<sup>1</sup>, Banks, N.<sup>2</sup>, Tibbo, P.<sup>3</sup>, Andreiev, A.L.<sup>1</sup>

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### ABSTRACT

**Background:** Traditionally, patients have been engaging with health care providers primarily through face-to-face, in-person encounters. The emergence of the COVID 19 pandemic has forced the majority of health care services to shift away from in-person visits. Virtual services became much more. Studies have shown that virtual mental health interventions can increase access, improve client engagement and understandably reduce costs. Several virtual interventions to deliver psychotherapy have been validated by literature with regards to positive outcomes. Young adults receiving treatment for early psychosis prefer to use web-based and mobile technologies to better understanding their illness and treatment, obtain information on education, career, and employment. However, some first episode psychosis clients reported lack of comfort in online settings. We aim to obtain a better understanding of the experience and expectation of use of virtual interventions in first episode patients.

**Methods:** The first part of our study will be in the form of a cross-sectional, survey design. The main purpose of this will be to provide a better understanding on the impact of utilizing a virtual platform for delivery of services. While this is not the main purpose of our study, it is an important starting point, which will provide further guidance with regards to the second part of the study. The second part of the design will follow a qualitative approach, looking at focus groups with patients to explore views and attitudes regarding virtual care. These groups will look at patients' knowledge of utilizing digital tools and attitudes towards receiving virtual assessments. This analysis of the transcripts obtained will use inductive thematic analysis to identify prevalent themes and recurring patterns in order to generate lists of overarching themes.

**Results and Conclusions:** The results of study will be used to improve current virtual interventions to promote better care, rapport and adherence to treatment. At present, results are pending.

### KEYWORDS

Virtual, Psychosis, Intervention

### LEARNING OBJECTIVES

1. Obtaining a better understanding on the impact of utilizing a virtual platform for delivery of services.
2. Learning about patient knowledge of digital tool use and their attitudes towards receiving virtual assessments.
3. Gathering ideas to improve current virtual interventions to promote better care, rapport and adherence to treatment.

# Fatigue symptoms and COVID-19 recovery: A systematic review and meta-analysis

Rao, S.<sup>1</sup>, Benzouak, T.<sup>2</sup>, Gunpat, S.<sup>2</sup>, Burns, R.J.<sup>2</sup>, Tahir, T.A.<sup>3</sup>, Jolles, S.<sup>4</sup>, Kisely, S.<sup>5</sup>

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## ABSTRACT

**Background:** Reports of persistent fatigue symptoms following COVID-19 recovery are emerging. However, the prevalence and risk factors associated with fatigue in individuals with a past diagnosis of SARS-CoV-2 infection remain largely unknown. We performed a systematic review to evaluate fatigue symptoms during post-recovery stages of patients diagnosed by PCR testing.

**Methods:** A search of Medline, Embase, PsycINFO, CINAHL, Web of Science, Scopus, trial registries, Google Scholar and pre-print servers was conducted. Overall and subgroup meta-analyses were conducted for each recruitment setting and each month following recovery.

**Results:** A total of 41 studies were included. Patients that recovered from COVID-19 were 3.69 times more at risk of developing fatigue symptoms when compared to healthy controls ( $p < 0.001$ ). No significant difference was observed when comparing COVID-19 patients that recovered from COVID-19 following negative PCR testing with patients testing positive for COVID-19 ( $p = 0.420$ ). The overall prevalence of fatigue was 42% within the first six months of recovery. Patient setting accounted for 11% of the variance ( $p < 0.001$ ) in fatigue symptoms. The prevalence of fatigue amongst patients discharged from inpatient care was 51.7% during follow-ups within the first month and 52.7% during follow-ups between one and two months post-discharge. Within the community, the prevalence of fatigue was 9.7%. Female patients were found to be more likely to experience post-COVID-19 fatigue (OR = 1.782, 95%CI [1.531, 2.870]). Hypertension was further found to exert a small moderating effect on the association between COVID-19 recovery and fatigue symptoms ( $R^2 = 0.02$ ,  $\beta = 2.777$ , 95%CI [0.148, 5.406],  $p = 0.038$ ).

**Conclusions:** Fatigue symptoms are associated with functional impairments that can have devastating economic and social implications. The identification of long-term management for fatigue experiences beyond acute stages of SARS-CoV-2 infection remains essential to the advancement of patient and public health outcomes.

## KEYWORDS

Fatigue, Post-COVID syndrome, Long COVID

## LEARNING OBJECTIVES

1. Prevalence of fatigue in relation to the type of care received (e.g., inpatient, outpatient, community samples).
2. Prevalence of fatigue within different follow-up periods (e.g., 30 days, 60 days, 90 days, 120 days).
3. Protective or risk factors that predict fatigue in patients recovering from COVID-19.

# Obstetrical complications and work duties in pregnant canadian psychiatry residents

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<sup>2</sup>Royal Ottawa Mental Health Centre

## ABSTRACT

**Background:** Pregnant Canadian medical and surgical residents are at increased risk of obstetrical complications compared to the general population. However, program policies regarding pregnancy are extremely varied, especially those outlining when residents can stop call. It is unclear whether programs have additional workplace accommodation policies in place. Data on the effect of work conditions on pregnancies could lead to more informed program policies to support resident wellness and reduce obstetrical and mental health complications.

**Methods:** Voluntary anonymous electronic surveys were completed by Canadian female psychiatry residents who had a completed pregnancy during residency. Qualitative analysis and proportional odds logistic regression analysis were applied.

**Results:** There were 50 survey responses, from across Canada. 76% of respondents wanted to go off call earlier than they did. The odds of wanting to go off call earlier was 184% higher with each subsequent post-graduate year, and 244% higher in residents doing 5-8 calls/month (compared to 0-4 calls/month). 34% of respondents went off call early, largely due to medical concerns (88.2%). The main barriers to going off call were high expectations of self (83.8%), fear of discrimination from peers (75.7%), and guilt about increased workload for peers (67.6%). 42.9% of respondents were unsure if workplace accommodations were available, while 30.6% stated they were not. Barriers to taking accommodations were high expectations of self (65%), unsure of policy (62.5%) and fear of discrimination from peers (62.5%). 62% of respondents experienced medical or mental health problems in the peri-partum period. 58% of respondents had concerns regarding their personal safety during pregnancy. Respondents felt that visible pregnancy had increased risk of violence and abuse from agitated patients.

**Conclusions:** There are unique risks during pregnancy for Psychiatry residents in Canada. As high expectations of self and guilt are identified as major barriers to asking for accommodations or going off call, clear program policies are necessary to reduce mental health and obstetrical risks.

## KEYWORDS

Mental health in pregnancy, Psychiatry internship, Workplace culture in residency

## LEARNING OBJECTIVES

1. Understand varied experiences during pregnancy for psychiatry residents in Canada
2. Understand barriers to taking accommodations during pregnancy.
3. Learn about risks specific to Psychiatry residents during pregnancy.

# Sleep architecture and emotional inhibition processing in adolescents hospitalized during a suicidal crisis: Preliminary findings

Lanthier, M.<sup>1,2</sup>, Tavakoli, P.<sup>3</sup>, Porteous, M.<sup>1,2</sup>, Bofo, A.<sup>4,5</sup>, Campbell, K.<sup>2</sup>, De Koninck, J.<sup>1,2</sup>, Robillard, R.<sup>1,2</sup>

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## ABSTRACT

**Background:** In Canada, suicide is the second most common cause of death for adolescents. In previous studies, we observed that adolescents in suicidal crisis have more light sleep and lower neural resources mobilized by inhibition processing compared to healthy adolescents. Their inhibitory control can be influenced by emotional valence. This study aimed to determine how sleep architecture in suicidal teens may relate to inhibition processing in response to stimuli with neutral, positive and negative emotional valence.

**Methods:** Nine adolescents between 12 and 17 years of age (77.8% females, Mean+SD = 15.0 + 1.7 y.o.) who attempted suicide were recruited while hospitalized for a suicidal crisis in a psychiatric inpatient unit. Of those, all had a clinical diagnosis of depression based on DSM-V criteria. Polysomnography and event-related potentials were recorded in patients' bedrooms. Event-related potentials were recorded during a Go/NoGo task involving pictures of emotionally neutral, sad, and happy faces. Pearson correlations were conducted to evaluate potential associations between sleep architecture parameters and the P3d, a brain response thought to reflect inhibition processing (i.e. difference waveform calculated as NoGo minus Go trials).

**Results:** All participants had significant suicidal symptoms on the adolescent version of the Suicidal Ideation Questionnaire (range: 32-82, Mean+SD = 46.3 + 16.6), and 88.9% were taking psychotropic medications. Higher amounts of NREM2 sleep ( $r=-.82$ ,  $p = .007$ ) and lower amounts of NREM3 sleep ( $r=.68$ ,  $p=.043$ ) significantly correlated with lower amplitude of the P3d in response to sad stimuli. No such association reached the significance level for happy or neutral stimuli.

**Conclusions:** These preliminary findings suggest that shallower sleep is associated with fewer neural resources mobilized by inhibitory processes in adolescents with acute suicidal risk, especially in contexts of negative emotional valence. Thus, addressing sleep disturbances while managing suicidal crises in adolescents is vital.

## KEYWORDS

Sleep, Inhibition, Suicidal crisis

## LEARNING OBJECTIVES

1. Review existing knowledge on the sleep correlates of suicidality in adolescents.
2. Compare emotional inhibitory processes in adolescents with acute suicidal risk to healthy adolescents (with event-related potentials).
3. Determine how sleep architecture in suicidal teens may relate to inhibition processing with different emotional valence stimuli.

## Analysis of substances detected with a TeKnoScan on forensic psychiatry units: An 18-month review

Wu, A.<sup>3</sup>, Olagunju, A.T.<sup>1,2</sup>, Boudreau, J.<sup>2</sup>, Nagari, S.<sup>1,2</sup>, Chaimowitz, G.A.<sup>1,2</sup>

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<sup>3</sup>University of Ottawa, Department of Psychiatry

### ABSTRACT

**Background and aims:** A significant proportion of forensic psychiatric patients have a history of substance use disorder. Several lines of evidence have shown that psychoactive substance use can increase the risk of violence, recidivism, and prolong hospitalization in forensic patients. Hence, forensic psychiatric hospitals often aim to limit the penetration of substances into their units. The use of psychoactive substances in forensic psychiatric units have commonly been detected with urine drug screening. However, urine drug screening has limitations and patients can tamper with the sample to yield false results. The purpose of this paper is to review the preliminary data gathered from using a TeKnoScan machine to detect trace substances within a forensic hospital setting.

**Methods:** This 18-month retrospective review study was conducted at the forensic psychiatric units in St. Joseph's Healthcare, Hamilton. The data were derived from samples collected to detect trace substances using the TeknoScan machine. Unit staff members were trained in the use of the machine to process samples collected from surfaces based on clinical suspicion. Each recorded use was manually reviewed and collected to provide data.

**Results:** From January 2020 to June 2021, 217 samples were recorded in the machine. 58 (26%) samples returned positive for detection of trace substances. Out of the positive samples, THC was identified most frequently (29%), followed by methamphetamines (23%) and cocaine (18%). Other identified substances included MDMA, heroine, morphine, LSD, tramadol, methyl benzoate, ketamine, and barbiturates. When reviewing gross trends, there was a general reduction in the number of positive samples following the COVID lockdown restrictions in March 2020.

**Conclusions:** The TeKnoScan machine proved to be a useful tool to detect trace samples of psychoactive substances in forensic psychiatric units. Staff training is important to ensure familiarity with the machine and promote adequate utility.

### KEYWORDS

Substance use, Forensic psychiatry, Drug screening

### LEARNING OBJECTIVES

1. Review the connection between substance use and clinical and risk outcomes.
2. Provide an overview on the use of TeKnoScan machine in detecting trace amount of substances.
3. Describe the types and trends of detected substances, and discuss the role of technology in the identification and management of substance use problems in forensic population.

# Association of a novel MRI-based measure of locus coeruleus-norepinephrine system integrity with Braak stage and neuropsychiatric symptom severity in Alzheimer's disease

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## ABSTRACT

**Background:** The clinical and pathophysiological correlates of degeneration of the locus coeruleus (LC)-norepinephrine system in Alzheimer's disease (AD) are imperfectly understood. This study assessed integrity of the LC-norepinephrine system using a novel and non-invasive in-vivo method, neuromelanin-sensitive MRI (NM-MRI), to determine if LC integrity is associated with severity of AD and with NPS, independent of aspects of cortical pathophysiology (amyloid- $\beta$  and tau burden).

**Methods:** The LC was segmented on unprocessed NM-MRI images and divided into 5 rostrocaudal sections using a novel semi-automated algorithm that searched for hyperintense LC voxels within an over-inclusive LC mask registered from standardized space to native space. Manual LC segmentation was also performed to compare against the semi-automated segmentation method. Braak stage of AD was derived from regional binding of [18F]MK6240. NPS were assessed with the Mild Behavioral Impairment Checklist, cognitive impairment with the Mini-Mental State Exam, and dementia severity with the Clinical Dementia Rating Scale.

**Results:** Signal contrast was decreased in tau-positive participants in all LC sections except for those on the rostral and caudal ends. This decrease in signal contrast was most pronounced in mid-caudal LC ( $t_{186}=-3.93$ ,  $p=0.0001$ ). Therefore, this portion of the LC was examined in subsequent analyses. LC signal contrast here was negatively correlated to Braak stage (Spearman  $\rho=-0.31$ ,  $p=0.00007$ ), cognitive impairment ( $\rho=-0.15$ ,  $p=0.048$ ), and dementia severity ( $\rho=-0.28$ ,  $p=0.0001$ ). Moreover, semi-automated LC segmentation performed slightly better than manual LC segmentation in identifying AD-related LC signal loss.

**Conclusions:** NM-MRI reveals loss of LC integrity that correlates to severity of AD. These results demonstrate the utility of NM-MRI to interrogate the role of the norepinephrine system in human studies of the mechanisms of AD pathophysiology. They also provide early evidence in favor of NM-MRI as a practical and non-invasive biomarker that has potential to indicate NPS risk or likelihood of response to specific treatments.

## KEYWORDS

Locus Coeruleus, Neuromelanin MRI, Alzheimer's Disease

## LEARNING OBJECTIVES

1. Determine whether integrity of the LC-norepinephrine system, assessed with NM-MRI, is associated with stage of AD and with neuropsychiatric symptoms, independent of aspects of cortical pathophysiology (amyloid- $\beta$  and tau burden, gray matter volume).
2. Demonstrate the utility of a novel and practical method to interrogate the human norepinephrine system in vivo, since this method provides insight into the neurobiological basis of neuropsychiatric symptoms of Alzheimer's disease and could have potential as a biomarker to guide their treatment.
3. Compare the performance of the semi-automated LC segmentation to the manual LC segmentation in identifying AD-related LC signal loss.

## Implementation of a mental health care pathway between primary care and community-based child and youth mental health providers in Northern Ontario

Cappelli, M.<sup>1,2</sup>, Cloutier, P.<sup>1</sup>, Radomski, A.<sup>1,2</sup>, Polihronis, C.<sup>2</sup>, Ziebell, L.<sup>2</sup>

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### ABSTRACT

**Background:** A care pathway ensures children and youth presenting to primary care (PC) who require a referral to community based mental health and addiction services (CMHA) reach the right type of service for their needs. In Ontario, a policy ready paper (Cappelli & Leon, 2017) highlighted the need for PC pathways to improve access to mental health care for children and youth.

**Methods:** In 2019, a 2-year demonstration trial began in 7 Ontario communities. Care pathways between PC and CMHA were created and contained two important components. First, a common screening tool (HEADS-ED) with strong psychometric properties was completed by PC practitioners. Second, a referral-disposition form was used to create and close the feedback loop between CMHA services and PC. The CMHA staff (administration) called the client after 30 days to complete a brief satisfaction survey. Data collection from one of the sites (Algoma, Northern Ontario), that began prior to and continued during the pandemic, is now complete.

**Results:** From Sept 2019 to May 2021, PC practitioners referred 166 children and youth clients (50% male; M age = 11 yrs) to the lead CMHA, resulting in excellent pathway completion (PC - 99%; CMHA - 98%). Turn-around time for the referral form to be sent back to PC averaged 2 weeks. Within the month, 51% of referred clients had received services. At 1-month post-referral, 82% of contacted participants were satisfied with the wait time and 70% were satisfied with the ease of access to mental health services.

**Conclusions:** These preliminary results indicate that pathway uptake and satisfaction with accessing services was successful at this site. Evaluation among the remaining demonstration sites is ongoing.

### KEYWORDS

Mental health, Primary care, Pathways

### LEARNING OBJECTIVES

1. Learn how a primary care health organization (PC) and community mental health agency (CMHA) in Northern Ontario partnered to improve access to mental health services.
2. Understand how a common screening tool (HEADS-ED) and referral disposition form can improve communication between PC and CMHA.
3. Examine the results of an improved pathway on referral turnaround time and client satisfaction with ease of access to mental health services.



## Identifying, measuring, implementing, and evaluating trauma-informed care in practice

Stokes, Y.<sup>1,2</sup>, Aggarwal, D.<sup>2</sup>, Cloutier, P.<sup>2</sup>, Lewis, K.B.<sup>1</sup>, Tricco, A.C.<sup>3,4</sup>, Jacob, J.D.<sup>1</sup>, Hambrick, E.<sup>5</sup>, Demery-Varin, M.<sup>1,2</sup>, Gould, J.<sup>2</sup>, Haider, M.<sup>2</sup>, Graham, I.D.<sup>1,6</sup>

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### ABSTRACT

**Background:** Trauma-informed care (TIC) is an emerging concept that involves addressing needs of those with histories of trauma. While interest in TIC has grown, the evidence supporting TIC interventions remains undeveloped. This project is conceptualized in two phases. The objectives of Phase 1 are to: 1) systematically identify and analyze TIC interventions used in pediatric mental health settings in Canada and abroad, 2) identify and analyze strategies used to implement the TIC interventions identified in Part 1, 3) determine how the TIC interventions in Part 1 have been evaluated and to synthesize the results of these evaluations, and 4) systematically identify outcome measures used in evaluation TIC interventions, and analyze their psychometric properties. Phase 2 aims to 1) select with the Children's Hospital of Eastern Ontario (CHEO) a TIC intervention and 2) co-develop an implementation plan and an evaluation protocol. Guided by principles of integrated knowledge translation, an approach that brings together researchers and other stakeholders, an advisory committee composed of clinicians, leaders, and researchers at CHEO are providing guidance throughout the project to ensure practical relevance of the research and facilitate its implementation in practice.

**Methods:** We are conducting a two-phased multi-methods study. Phase 1: A four-part systematic environmental scan of Canadian publicly funded settings and systematic review of the global literature. Phase 2: Triangulation of results from Phase 1, followed by focus groups with leadership, staff, and family representatives at CHEO to select and tailor the specific TIC intervention(s), implementation strategies, and outcome measures to evaluate. Co-development of an implementation plan and evaluation protocol.

**Results and Conclusions:** The protocol and study status will be presented and discussed in the context of CHEO's ongoing efforts to integrate TIC into clinical practice and policy.

### KEYWORDS

Trauma-informed, Pediatric, Implementation

### LEARNING OBJECTIVES

1. To describe an integrated knowledge translation (iKT) project related to trauma-informed care taking place currently at CHEO.
2. To identify and discuss TIC interventions used in pediatric mental health inpatient/residential settings and the implementation strategies used.
3. To expand on the importance of clear reporting of mental health care interventions and implementation strategies.

## The HEADS-ED under 6: Piloting a new communimetric mental health screening tool for children under 6

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### ABSTRACT

**Background:** Communimetric screening tools are important as they help the clinician to identify and communicate common areas of need that require action. Based on the original HEADS-ED communimetric screening tool which has strong psychometric properties and is used in Emergency Departments and as part of centralized intake systems for those 6 and above, we developed and piloted a new HEADS-ED screening tool for children under the age of 6.

**Methods:** The HEADS-ED under 6 (Home, Eating/sleeping, Activities/peers, Development/speech language/motor, Safety, Emotions/behaviours, and Discharge resources) was developed to screen for mental health (MH) functioning and development concerns requiring action for children under the age of 6. From November 2019 to March 2021, the HEADS-ED under 6 was piloted by a lead Community Mental Health Agency (Children First) in Windsor-Essex County.

**Results:** 95% of children and youth accessing community MH services (n =536/566) were screened with the HEADS-ED at intake. Total scores were highest for those requiring priority services (M = 6.6) and lowest for those exiting services (M = 3.6). Almost 50% had immediate needs for discharge resources. ICC's between intake and clinician assessments were highest for Development/speech, language/motor concerns.

**Conclusions:** These preliminary results indicate the HEADS-ED under 6 was an easy screening tool for intake workers and clinicians to use to rate the severity of MH needs, and was helpful in determining level of service required.

### KEYWORDS

Mental health screening, Community mental health services, Children

### LEARNING OBJECTIVES

1. To become familiar with the HEADS-ED Under 6 Screening Tool (7 domains and level of need).
2. To understand how the tool is used to inform decision making in community mental health agencies.
3. To understand the correspondence between intake and clinician assessments across the seven HEADS-ED domains and in decision making for regular or priority services.

# Neural mechanisms, predictors of response, and clinical and cognitive outcomes of electroconvulsive therapy: A study protocol and preliminary results

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## ABSTRACT

**Background:** Electroconvulsive therapy (ECT) is an effective treatment for many mental health disorders. Unfortunately, cognitive side effects are often associated with ECT and not all patients will respond. Developing a neurobiological predictor of outcome to identify which patients will benefit from ECT is essential. In addition, the neural mechanisms of ECT are not well understood and research into the cognitive symptoms is inconsistent.

**Methods:** We aim to recruit 60 males and females, 18 years or older, with diverse mental health disorders (i.e., depression, psychosis) receiving ECT. Transcranial magnetic stimulation (TMS) is applied to the left primary motor cortex to explore the effect of ECT on excitatory and inhibitory brain mechanisms 72hrs pre- and post- acute ECT. Standard TMS measures are taken: 1) cortical silent period, 2) short interval intracortical inhibition (SICI), 3) long interval intracortical inhibition, and 4) intracortical facilitation (ICF). Cognitive and clinical measures are administered 72hrs pre- and post- acute ECT and one-month post- acute ECT. Our main outcome measures are the ElectroConvulsive therapy Cognitive Assessment and the Quick Inventory of Depressive Symptoms.

**Results:** Preliminary data from five participants show an average decrease of 11% on cognitive scores 72hrs post-ECT and a 7% increase one-month post-ECT. Depression scores show an average improvement of 54% 72 hours post-ECT and 33% one-month post-ECT. Individual TMS data from two participants show a 43% and 37% increase in SICI-related inhibition post-ECT, while a 25% and 45% decrease in ICF-related excitation was obtained post-ECT.

**Conclusions:** Preliminary data demonstrates cognitive performance decreased immediately post-ECT, but improved one-month later, suggesting the negative impact of ECT on cognition is short-term. Data also suggests ECT improves depressive symptoms in the short- and longer term. Finally, ECT increases cortical inhibition 72 hours-post ECT, as previously suggested by pre-clinical studies. With additional participants, predictors of response will be explored.

## KEYWORDS

Electroconvulsive therapy, Transcranial magnetic stimulation, Cognition

## LEARNING OBJECTIVES

1. To describe an integrated knowledge translation (iKT) project related to trauma-informed care taking place currently at CHEO.
2. To discover a predictor of clinical response to electroconvulsive therapy (ECT).
3. To better understand neural mechanisms of ECT, and to better understand the cognitive effect of ECT.

## A family support group: From fracture to repair, hope out of despair

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### ABSTRACT

**Background:** Family members of individuals served by the forensic system are often overlooked in clinical practice and research. Family have reported various emotional, social, and psychological stressors and stigma associated with their loved ones' involvement with the forensic system. Family have reported feeling unprepared to support their loved one, and geographic restrictions often limit their involvement. In response to family members' needs identified in the literature and in our program, and adapted for COVID-19 considerations, we developed a virtual support group for families of individuals treated in the forensic psychiatry program of the Royal Ottawa Health Care Group. This presentation will provide an overview of the group modules and our preliminary results examining the effectiveness of the support group.

**Methods:** The group modules were adapted from in-person groups offered by our program, to an online format and in response to participant feedback. Ten weekly sessions of two hours duration – one hour psychoeducation followed by one hour of discussion - were facilitated on Zoom in the spring of 2021. Quantitative and qualitative outcomes were measured, including pre- and post-group psychological distress (Kessler Psychological Distress Scale) and caregiver burden (Burden Assessment Scale). Descriptive statistics were used.

**Results:** Six of sixteen group participants completed questionnaires. Sociodemographic variables of group participants will be presented. Results found a significant decrease in both caregiver burden and psychological distress following attendance at group sessions. Group participants reported the education and peer support components of sessions were helpful and that the virtual format was more accessible than in-person.

**Conclusions:** Preliminary results indicate that our family support group benefited family members of individuals served by our forensic program. Another 10-session family group will be offered in the fall of 2021. Ongoing collection of qualitative and quantitative data will further inform the dynamic evolution of modules, which may be adapted to other clinical settings.

### KEYWORDS

Family support, Forensic system, Peer support group

### LEARNING OBJECTIVES

1. To develop a working knowledge of the need and importance for caregiver support.
2. To gain an understanding of the format and composition of our caregiver support groups.
3. To appreciate the impact of our support group on family members' psychological distress levels and objective and subjective burden of caretaking.

## Mismatch negativity to multiple deviants are associated with different features of auditory hallucinations in schizophrenia

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### ABSTRACT

**Background:** Auditory hallucinations (AHs) are a key symptom in schizophrenia (SZ) that, in many, cause functional impairments and distress. Additionally, up to a third of individuals with SZ experience drug-resistant AHs. Further research into the underlying neuronal mechanisms of AHs could refine interventions. The mismatch negativity (MMN) is an auditory event-related potential that represents preattentive detection of stimulus deviance. MMN deficits are prominent in SZ; however, granular investigations of MMN deficits, and their relation to AH features in SZ are lacking.

**Methods:** Electroencephalographic activity was recorded from 14 SZ patients and 16 non-SZ healthy controls (HCs). MMNs to five deviants were elicited using two multi-feature paradigms (five speech [speech MMN] & five tone deviants [tone MMN]). AHs features were assessed using the Voices Acceptance & Action Scale (VAAS), Voice Power Differential Scale (VPDS) and Beliefs About Voices Questionnaire (BAVQ).

**Results:** Compared to HCs, SZ patients had smaller MMN amplitudes to tone and speech frequency ( $p < .001$ ), as well as tone and speech intensity ( $p < .05$ ) deviants. Higher VPDS scores were associated with smaller MMNs to frequency ( $p = .012$ ), intensity ( $p < .001$ ), location ( $p = .016$ ) and gap deviants ( $p = .03$ ). Further, VAAS-Command Hallucination scores were inversely related to MMN latency to the tone location deviant ( $p = .011$ ). Finally, higher BAVQ-Resistance sub-scores were positively correlated with MMN latency to the speech frequency deviant ( $p = .12$ ), while higher BAVQ-Engagement sub-scores were associated with larger MMNs elicited by speech constant deviants.

**Conclusions:** SZ patients showed MMN deficits to intensity and frequency deviants, regardless of paradigm. Specific AHs features were uniquely associated with specific MMN deviants.

### KEYWORDS

Schizophrenia, Mismatch negativity, Auditory hallucinations

### LEARNING OBJECTIVES

1. Learn about mismatch negativity in the context of schizophrenia
2. Learn about the association of the mismatch negativity with auditory hallucinations
3. Learn about future directions of this work

## Développement d'un programme de remédiation cognitive utilisant la réalité virtuelle pour la schizophrénie

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### RÉSUMÉ

**Contexte:** Les déficits cognitifs en schizophrénie demeurent un défi à traiter. Ils nuisent grandement au fonctionnement social et à la qualité de vie des patients. La remédiation cognitive constitue l'intervention la plus bénéfique pour améliorer le fonctionnement cognitif.

**Méthodologie:** Notre recherche vise à développer un programme efficace de remédiation cognitive en réalité virtuelle, motivant pour les patients et facile d'utilisation pour les cliniciens. La réalité virtuelle permet de créer des tâches et contextes représentant des situations courantes du quotidien. Nous émettons l'hypothèse que développer des tâches de remédiation cognitive dans un environnement virtuel avec l'aide des utilisateurs nous permettra de mieux identifier et comprendre leurs besoins et réalité. Cela nous permettra éventuellement d'augmenter les performances cognitives et le fonctionnement quotidien des patients.

**Résultats:** L'étude comporte une série de rencontres avec des patients partenaires et des cliniciens travaillant auprès de personnes ayant la schizophrénie pour identifier les besoins respectifs de ces utilisateurs potentiels et obtenir leurs avis quant à la pertinence des tâches et des contenus. Cette approche participative itérative permet de recueillir leurs rétroactions pour ajuster à chaque étape du développement le programme virtuel de remédiation cognitive. L'analyse des contenus est effectuée avec l'application NVivo et la récurrence des thèmes entre les deux groupes est comparée. L'environnement virtuel est développé en partenariat par le Laboratoire de cyberpsychologie, de l'UQO.

**Conclusions:** Cette recherche se poursuit depuis 2019. Jusqu'à présent, quatre thèmes principaux émergent des neuf rencontres de groupes: les barrières et conditions facilitantes à l'amélioration du fonctionnement cognitif, les objectifs cognitifs à viser, les tâches et composantes dans l'environnement virtuel pour y parvenir et les résultats attendus sur le fonctionnement. L'environnement virtuel comprend trois modules: un parcours d'autobus en milieu urbain, un souper dans un appartement et un emploi dans un restaurant. Une fois l'étude complétée, l'environnement sera testé pour en mesurer l'efficacité.

### MOTS CLÉS

Family support, Forensic system, Peer support group

### OBJECTIFS D'APPRENTISSAGE

1. Déterminer les besoins des personnes vivant avec la schizophrénie;
2. Déterminer les besoins des professionnels de la santé qui travaillent auprès des personnes vivant avec la schizophrénie;
3. Utiliser les besoins et les rétroactions des patients et des professionnels pour développer et adapter un programme de remédiation cognitive en réalité virtuelle.

