44th Harvey Stancer Research Day

Thursday, June 21, 2018 from 8:00am to 5:00pm
Chestnut Conference Centre, 89 Chestnut Street, Toronto

Psychiatry
UNIVERSITY OF TORONTO
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Dear Faculty and Students:

On behalf of the Harvey Stancer Research Day Planning Committee, I am delighted to welcome you to the Department of Psychiatry at the University of Toronto’s 44th annual Harvey Stancer Research Day!

Our Research Day begins with the 4th annual Mentorship Breakfast where our graduate student, psychiatry resident, and postdoctoral fellow trainees have the opportunity to connect with a group of outstanding faculty members in the Department who have generously given their time for this event.

For the keynote lecture, Dr. Deanna Barch joins us to present this year’s Trevor Young Lecture in Psychiatry Research entitled: “Early Emergence of Depression: Understanding Neural and Psychological Risk Factors and Treatment.” Dr. Barch is Chair of the Department of Psychological & Brain Sciences and the Gregory B. Couch Chair of Psychiatry at Washington University in St. Louis. She is one of the Principal Investigators of the Lifespan Human Connectome Project and the Adolescent Brain and Cognitive Development (ABCD) Study. Her cutting-edge research program is focused on understanding normative patterns of functional brain connectivity across development as well as the mechanisms that give rise to the challenges in behavior and cognition found in illnesses such as schizophrenia and depression, utilizing behavioral, neuroimaging and computational approaches.

Following Dr. Barch’s keynote address, we have a fantastic line-up of faculty plenary speakers who will present their papers, which span from health services to neurobiology, and represent our Department’s highest impact research contributions for 2017. Our plenary speakers are: Drs. Simone Vigod (JAMA), Sanjeev Kumar (JAMA Psychiatry), Daisy Singla (Ann Rev Clinical Psychology) and Paul Kurdyak (CMAJ). The programme for the afternoon will include lunch and our poster session (featuring over 100 posters) as well as our afternoon oral sessions showcasing the superb academic achievements of faculty and trainees in our Department across a diverse array of disciplines of psychiatry research. We will end our day with a reception where the winners of the Best Poster Presentation and Graduate Student, Resident, Fellow and Early Career Investigator Awards for best presentation will be announced.

I would like to thank the Department of Psychiatry for supporting this event, the scientific planning committee (Drs. Benjamin Goldstein, Tyler Kaster, Simone Vigod, Nicole Kozloff, Yona Lunsky, and Simina Toma), and the oral session chairs and poster judges for their help in selecting this year’s Harvey Stancer Research Day award winners. I would also like to thank Olesya Zaremba for her tremendous administrative support as well as Alyson Musial, Chris Meledes and all the other administrative staff within the Department of Psychiatry at the University of Toronto. Finally, Dr. Simone Vigod (HSRD Chair 2014-2017) was very generous with her time and support, which was so helpful in enabling a smooth transition into this role.

Sincerely,

Stephanie Ameis MD, MSc, FRCPC
Harvey Stancer Research Day Chair
O’Brien Scholar, Child and Youth Mental Health Collaborative at CAMH and Sick Kids, Staff Psychiatrist, Child and Youth Psychiatry, Centre for Addiction and Mental Health (CAMH), Assistant Professor, Department of Psychiatry, University of Toronto
Deanna Barch is currently Chair of the Department of Psychological & Brain Sciences and the Gregory Couch Chair of Psychiatry. She received her undergraduate degree from Northwestern University, completed her Ph.D. at the University of Illinois in Champaign-Urbana and completed a postdoctoral fellowship at Western Psychiatric Institute and Clinic. Dr. Barch is Deputy Editor at Biological Psychiatry and is on the Editorial Boards of Schizophrenia Bulletin, Journal of Abnormal Psychology, and Clinical Psychological Science. Dr. Barch is on the Scientific Board of the Brain and Behavior Research Foundation and the Stanley Foundation and on the Executive Committee of the Association for Psychological Science. Dr. Barch’s research has been funded by the NIMH, NARSAD, NSF, and the McDonnell Center for Systems Neuroscience. She is one of the Principal Investigators of the Lifespan Human Connectome Project and the Adolescent Brain and Cognitive Development Study. She is a Fellow of the Association for Psychological Science and a member of the American College of Neuropsychopharmacology. Her research program is focused on understanding normative patterns of functional brain connectivity across development as well as the mechanisms that give rise to the challenges in behavior and cognition found in illnesses such as schizophrenia and depression, utilizing behavioral, neuroimaging and computational approaches.
Manuscript Title

Extent of Dorsolateral Prefrontal Cortex Plasticity and Its Association With Working Memory in Patients With Alzheimer Disease

Importance: The extent of dorsolateral prefrontal cortex (DLPFC) plasticity in Alzheimer disease (AD) and its association with working memory are not known.

Objectives: To determine whether participants with AD had impaired DLPFC plasticity compared with healthy control participants, to compare working memory between participants with AD and controls, and to determine whether DLPFC plasticity was associated with working memory.

Design, Setting, and Participants: This cross-sectional study included 32 participants with AD who were 65 years or older and met diagnostic criteria for dementia due to probable AD with a score of at least 17 on the Mini-Mental State Examination and 16 age-matched control participants. Participants were recruited from a university teaching hospital from May 2013 to October 2016.

Main Outcomes and Measures: Plasticity of the DLPFC measured as potentiation of cortical-evoked activity using paired associative stimulation (a combination of peripheral nerve electrical stimulation and transcranial magnetic stimulation) combined with electroencephalography. Working memory was assessed with the n-back task (1- and 2-back) and measured using the A' statistic.

Results: Among the 32 participants with AD, 17 were women and 15 were men (mean [SD] age, 76.3 [6.3] years); among the 16 controls, 8 were men and 8 were women (mean [SD] age, 76.4 [5.1] years). Participants with AD had impaired DLPFC plasticity (mean [SD] potentiation, 1.18 [0.25]) compared with controls (mean [SD] potentiation, 1.40 [0.35]; F1,44 = 5.90; P = .02; between-group comparison, Cohen d = 0.77; P = .01). Participants with AD also had impaired performances on the 1-back condition (mean [SD] A' = 0.47 [0.30]) compared with controls (mean [SD] A' = 0.96 [0.01]; Cohen d = 1.86; P < .001), with similar findings for participants with AD on the 2-back condition (mean [SD] A' = 0.29 [0.2]) compared with controls (mean [SD], A' = 0.85 [0.18]; Cohen d = 2.83; P < .001). Plasticity of DLPFC was positively associated with working memory performance on the 1-back A' (parameter estimate B [SE] = 0.32 [0.13]; standardized β = 0.29; P = .02) and 2-back A' (B [SE] = 0.43 [0.15]; β = 0.39; P = .006) across both groups after controlling for age, education, and attention.

CONCLUSIONS AND RELEVANCE This study demonstrated impaired in vivo DLPFC plasticity in patients with AD. The findings support the use of DLPFC plasticity as a measure of DLPFC function and a potential treatment target to enhance DLPFC function and working memory in patients with AD.
Trends in standardized mortality among individuals with schizophrenia, 1993-2012: a population-based, repeated cross-sectional study

Background: We examined mortality time trends and premature mortality among individuals with and without schizophrenia over a 20-year period.

METHODS: In this population-based, repeated cross-sectional study, we identified all individual deaths that occurred in Ontario between 1993 and 2012 in persons aged 15 and over. We plotted overall and cause-specific age- and sex standardized mortality rates (ASMRs), stratified all-cause ASMR trends by sociodemographic characteristics, and analyzed premature mortality using years of potential life lost. Additionally, we calculated mortality rate ratios (MRRs) using negative binomial regression with adjustment for age, sex, income, rurality and year of death.

RESULTS: We identified 31,349 deaths among persons with schizophrenia, and 1,589,902 deaths among those without schizophrenia. Mortality rates among people with schizophrenia were 3 times higher than among those without schizophrenia (adjusted MRR 3.12, 95% confidence interval 3.06–3.17). Allcause ASMRs in both groups declined in parallel over the study period, by about 35%, and were higher for men, for those with low income and for rural dwellers. The absolute ASMR difference also declined throughout the study period (from 16.15 to 10.49 deaths per 1000 persons). Cause-specific ASMRs were greater among those with schizophrenia, with circulatory conditions accounting for most deaths between 1993 and 2012, whereas neoplasms became the leading cause of death for those without schizophrenia after 2005. Individuals with schizophrenia also died, on average, 8 years younger than those without schizophrenia, losing more potential years of life.

Interpretation: Although mortality rates among people with schizophrenia have declined over the past 2 decades, specialized approaches may be required to close the persistent 3-fold relative mortality gap with the general population.
Purpose: Common mental disorders, including depression, anxiety, and posttraumatic stress, are leading causes of disability worldwide. This presentation will provide an overview of the innovations used in low and middle income countries to disseminate psychological treatments delivered by non-specialist providers to target depression, anxiety and trauma in adults and their implications for high-income country settings.

Methods: Drawing upon a recent systematic review and meta-analysis of brief, psychological treatments in community and primary care settings in developing countries, we examined relevant implementation processes related to who, what, where and how interventions of common mental disorders were delivered. This involved the development and testing of a taxonomy of treatment components, comprising elements (specific and non-specific) and techniques, that cut across treatment packages and their role on trial effectiveness among eligible trials (N=27).

Results: Treatments were commonly delivered by community health workers or peers in primary care or community settings; they usually were delivered with fewer than 10 sessions over 2–3 months in an individual, face-to-face format. Overall, treatments included an average of 5.22 out of 9 nonspecific elements and 7.81 out of 18 specific elements. The five most commonly endorsed nonspecific elements were empathy (88.9%); collaboration (85.2%); active listening (77.8%); normalizing treatment or aspects of the illness (70.4%), or both; and involving family members or a significant other (63.0%). The five most commonly used specific elements were eliciting or identifying social support (85.2%); engaging in problem-solving (80.8%); identifying or eliciting affect (76.9%), or both; linking affect to events (76.9%); and identifying thoughts (63.0%). At least one behavioral, interpersonal, and emotional element was used in 23 trials (85%); at least one cognitive element was used in 20 trials (74.1%). The strongest associations were observed for the interpersonal elements (β = 0.442, p = 0.029), emotional elements (β = 0.415, p = 0.046), and nonspecific (engagement) elements (β = 0.409, p = 0.052).

Conclusion: Innovations in developing countries share a number of key treatment components and implementation processes, including the types of elements and techniques, the training and supervision formats for NSPs, and the number of sessions and duration during which the treatment is delivered. These common implementation processes could act as a blueprint for scaling-up these psychological treatments, not just in the LMICs from where our evidence base was generated but globally.
Importance: Previous observations of a higher risk of child autism spectrum disorder with serotonergic antidepressant exposure during pregnancy may have been confounded.

Objective: To evaluate the association between serotonergic antidepressant exposure during pregnancy and child autism spectrum disorder.

Design, Setting, and Participants: Retrospective cohort study. Health administrative data sets were used to study children born to mothers who were receiving public prescription drug coverage during pregnancy in Ontario, Canada, from 2002-2010, reflecting 4.2% of births. Children were followed up until March 31, 2014.

Exposures: Serotonergic antidepressant exposure was defined as 2 or more consecutive maternal prescriptions for a selective serotonin or serotonin-norepinephrine reuptake inhibitor between conception and delivery.

Main Outcomes and Measures: Child autism spectrum disorder identified after the age of 2 years. Exposure group differences were addressed by inverse probability of treatment weighting based on derived high-dimensional propensity scores (computerized algorithm used to select a large number of potential confounders) and by comparing exposed children with unexposed siblings.

Results: There were 35 906 singleton births at a mean gestational age of 38.7 weeks (50.4% were male, mean maternal age was 26.7 years, and mean duration of follow-up was 4.95 years). In the 2837 pregnancies (7.9%) exposed to antidepressants, 2.0% (95% CI, 1.6%-2.6%) of children were diagnosed with autism spectrum disorder. The incidence of autism spectrum disorder was 4.51 per 1000 person-years among children exposed to antidepressants vs 2.03 per 1000 person-years among unexposed children (between-group difference, 2.48 [95% CI, 2.33-2.62] per 1000 person-years; hazard ratio [HR], 2.16 [95% CI, 1.64-2.86]; adjusted HR, 1.59 [95% CI, 1.17-2.17]). After inverse probability of treatment weighting based on the high-dimensional propensity score, the association was not significant (HR, 1.61 [95% CI, 0.997-2.59]). The association was also not significant when exposed children were compared with unexposed siblings (incidence of autism spectrum disorder was 3.40 per 1000 person-years vs 2.05 per 1000 person-years, respectively; adjusted HR, 1.60 [95% CI, 0.69-3.74]).

Conclusions and Relevance: In children born to mothers receiving public drug coverage in Ontario, Canada, in utero serotonergic antidepressant exposure compared with no exposure was not associated with autism spectrum disorder in the child. Although a causal relationship cannot be ruled out, the previously observed association may be explained by other factors.
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**Room:** St. George

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### Session B5: Treatment Innovation
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Full Abstract

Purpose: Forty percent of children with autism spectrum disorder (ASD) will meet criteria for an anxiety disorder during childhood. Restricted and repetitive behaviours (RRBs) (e.g. hand flapping, rigid routines) are a core symptom of ASD, which correlate with anxiety in cross sectional studies. Whether RRB severity at ASD diagnosis is a risk factor for future anxiety is unknown.

Methods: The Pathways in ASD study is a longitudinal inception cohort of children with ASD (n=421). RRB severity at age 3-5 years was classified as mild, moderate, or severe based on the Autism Diagnostic Interview-Revised (using a 25th and 75th percentile split of the RRB-subscale score). Anxiety was measured at ages 8-11 years on the Child Behavior Checklist (CBCL-anxiety T-score >65). Multivariable logistic regression analysis was used to examine the association between RRB severity and anxiety, while adjusting for confounders (age, sex, IQ, baseline anxiety, parenting stress).

Results: On univariate analysis, having severe RRBs at diagnosis was associated with a 6.4 fold (95% CI: 2.8-14.6) increase in the odds of developing anxiety compared to having mild RRBs. After adjusting for confounders, the association remained significant [OR: 3.2 (95% CI: 1.1-9.1)]. Baseline anxiety on the CBCL was also associated with increased risk for future anxiety [OR: 1.2 per CBCL point (95% CI: 1.1-1.4)]; other covariates were non-significant.

Conclusion: RRB severity at the time of ASD diagnosis is an independent risk factor for subsequent anxiety. A better understanding of which children with ASD will develop anxiety can help to inform preventative strategies and treatments.
Purpose: Decisions about antidepressant medication use in pregnancy are ideally made before conception to optimize maternal and fetal health, however little is known about preconception women making these decisions. We aimed to understand differences between preconception and pregnant women making decisions regarding antidepressant use in pregnancy.

Methods: 95 Canadian women with depression were recruited for a clinical trial of a decisional tool regarding antidepressant use in pregnancy. Using baseline data (before intervention), we compared preconception (planning pregnancy) versus pregnant participants on sociodemographic and clinical characteristics, including decisional conflict. We compared preconception to pregnant women on their plans to use (vs. not use) antidepressants in pregnancy using logistic regression, adjusting for other characteristics associated with antidepressant plans.

Results: About 57.9% of participants (n=55) were preconception. Preconception women were more likely to be using antidepressants (85.5% vs. 45.0%), report previous antidepressant benefits (70.9% vs. 53.5%), and have high Decisional Conflict Scale scores (≥37.5, 83.6% vs. 60.0%). They were less likely to have active depressive symptoms (Edinburgh Postnatal Depression Scale score ≥13, 40.0% vs. 65.0%), and be under psychiatric care (29.1% vs. 52.5%). About 60% of preconception vs. 32.5% of pregnant women planned to use antidepressants in pregnancy (odds ratio, OR, 3.11, 95% confidence interval, CI 1.33–7.32), however this association attenuated after adjustments (adjusted OR 2.79, 95% CI 0.81–9.62).

Conclusions/Implications: Preconception and pregnant women were similarly likely to plan to use antidepressants in pregnancy after considering differences between groups. Preconception women had higher decisional conflict, suggesting a gap in decision-making support for this population.
### Department Division
Brain and Therapeutics

### Affiliation
Postdoctoral Clinical or Research Fellow

### Setting
University Health Network

### Abstract Type
Oral Presentation

### Research Theme
network-analysis, biomarker, depression

### Abstract Title
Distinct Network Structure of Depression Symptoms Among Responders and Non-Responders To Antidepressants and Placebo

### Co-Authors
Wendy Lou, Biostatistics, University of Toronto; Sidney Kennedy, St. Michael's Hospital, University of Toronto

### Full Abstract

**Introduction:** Studying the longitudinal structure of MDD symptomatology in relation to various network features such as centrality and connectivity could help identify the network structure. This project examined data from several antidepressant trials to explore the network structure of treatment response in MDD.

**Methods:** Data from two 8-week randomized placebo-controlled trials with duloxetine were included (n=494). Network-analysis was done using the qgraph package for R, MADRS data at the 6 available time points were each converted into a weights matrix that codes the connectivity structure between nodes in a network in matrix form. The results were validated in an independent clinical trial cohort (n=200), a cross-validation, trajectory and symptom-change analysis was done. A repeated measures ANOVA was used to examine change in network structure over time.

**Results:** A consistent pattern of increasing connectivity, greater magnitude of standard centrality features with time was noted among the duloxetine responders and replicated among placebo responders (p<0.01). Notably, a broad increase in connectivity across individual symptoms and an overall greater strength of connectivity was noted among responders with as compared to non-responders (p<0.01). The results were replicated in an independent cohort and cross-validated. Network features over time were different among responders and non-responders, differed based on trajectory of response and rate of symptom change (p<0.01).

**Conclusion:** The results point towards symptom specificity and their interconnectivity in antidepressant response. These network features could serve as potential signatures of antidepressant response and as starting points for treatment personalization by further investigation of molecular and neural circuit mechanisms underlying the connectivity patterns.
Abstract Title
Machine learning using brain imaging and neurocognitive data supports accelerated aging in schizophrenia spectrum, but not bipolar spectrum disorders.

Co-Authors
Navona Calarco, Centre for Addiction and Mental Health; Melissa Levesque, Centre for Addiction and Mental Health; Benoit Mulsant, Centre for Addiction and Mental Health; Saba Shahab, Centre for Addiction and Mental Health; Arash Nazeri, Centre for Addiction and Mental Health; Anne Wheeler, Centre for Addiction and Mental Health; George Foussias, Centre for Addiction and Mental Health; Tarek Rajji, Centre for Addiction and Mental Health; Aristotle Voineskos, Centre for Addiction and Mental Health

Full Abstract
Purpose: Emerging research suggests mental illness might evince ‘accelerated aging’, i.e., the early onset of brain changes and neurocognitive functions associated with advanced age. To test this hypothesis, we examined whether the ‘brain age’ of individuals with schizophrenia spectrum disorders (SSD) and bipolar spectrum disorders (BD), as predicted by a random forest algorithm, differs from their chronological age.

Methods: Structural and diffusion MRIs were obtained from 191 participants (68 SSD, 44 BD, 79 healthy controls (HC)) across the adult lifespan (18-83 years). The random forest algorithm was trained with 125 features (cortical thickness from 78 regions, fractional anisotropy from 38 regions, and 9 neurocognitive performance measures) from 50 HCs, and then tested on the remaining 141 participants.

Results: The algorithm revealed a difference between predicted and chronological age of 10.38 years (SE=1.37) in SSD, 0.04 years (2.57) in BD, and 1.29 years (2.11) in HC (F(2,138)=12.05, p=1.58x10^-5), with post hoc t-tests showing the SSD delta to be larger than that of HC (p=0.006) and BD (p=1.81x10^-6). Features most influential in brain age prediction were cortical thickness in the left rolandic operculum, left insula, and bilateral Heschl’s gyrus, and fractional anisotropy in the left posterior thalamic radiation and left anterior corona radiata.

Conclusions: These results support accelerated aging in SSD but not BD. A marked discrepancy in brain circuits impacted by differential predicted-to-chronological brain age may constitute a potential diagnostic or treatment biomarker.
Amotivation is associated with smaller ventral striatum volumes in older patients with schizophrenia

Purpose: Motivational deficits are prevalent in patients with schizophrenia, persist despite antipsychotic treatment, and predict long-term outcomes. Evidence suggests that patients with greater amotivation have smaller ventral striatum (VS) volumes. We wished to replicate this finding in a sample of older, chronically medicated patients with schizophrenia. Using structural imaging and positron emission tomography, we examined whether amotivation uniquely predicted VS volumes beyond the effects of striatal dopamine D2/3 receptor (D2/3R) blockade by antipsychotics.

Methods: Data from 41 older schizophrenia patients (mean age: 60.2 ± 6.7; 11 female) were reanalysed from previously published imaging data. We constructed multivariate linear stepwise regression models with VS volumes as the dependent variable and various sociodemographic and clinical variables as the initial predictors: age, gender, total brain volume, and antipsychotic striatal D2/3R occupancy. Amotivation was included as a subsequent step to determine any unique relationships with VS volumes beyond the contribution of the covariates. In a reduced sample (n = 36), general cognition was also included as a covariate.

Results: Amotivation uniquely explained 8% and 6% of the variance in right and left VS volumes, respectively (right: $\beta = -0.38$, $t = -2.48$, $P = .01$; left: $\beta = -0.31$, $t = -2.17$, $P = .03$). Considering cognition, amotivation levels uniquely explained 9% of the variance in right VS volumes ($\beta = -0.43$, $t = -0.26$, $P = .03$).

Conclusion: We replicate and extend the finding of reduced VS volumes with greater amotivation. We demonstrate this relationship uniquely beyond the potential contributions of striatal D2/3R blockade by antipsychotics. Elucidating the structural correlates of amotivation in schizophrenia may help develop treatments for this presently irremediable deficit.
**Abstract**

**Introduction:** Exposure to screen time (SCR) and screen time with food (SCR+F) for infants and toddlers is associated with multiple poor health outcomes. The existing literature addresses demographic and home media environmental factors. Our objective was to explore the association between parenting stress with child SCR and SCR+F at 7-18 months.

**Methods:** Participants were from The Applied Research Group for Kids (TARGet Kids!), a longitudinal cohort in Canada. Parents completed the Parenting Stress Index when children were 7-18 months of age. Typical weekly child SCR and SCR+F as well as clinically relevant maternal and child characteristics including child age, temperament, and family income were assessed with parent-completed questionnaires. Two separate multiple linear regression models were used to determine the independent association of parenting stress with SCR and with SCR+F.

**Results:** In our sample, 75.7% of children aged 7-18 months had SCR and 39.1% had SCR+F in a typical week. We found that parenting stress was not associated with SCR (n=525, p=0.513) or SCR+F (n=587, p=0.826). Self-reported income less than $100,000 per year (p<.001) and child negative affectivity (p=0.019), were associated with higher SCR+F. Child age was not associated with higher SCR+F (p=0.057).

**Conclusions:** We did not find that parenting stress was associated with screen time or screen time with food in our sample. Future research may focus on more diverse samples, the ubiquity and normalisation of SCR for children under the age of 2 years, and child characteristics such as gender in the use of SCR and SCR+F.
Purpose: Major Depressive Disorder (MDD) in adolescence is prevalent and debilitating. Many young people with depression either do not receive or respond to evidence-based treatment. Our group aims to improve treatment response through the use of an Integrated Care Pathway (ICP) based on a high quality Clinical Practice Guideline and measurement-based care (MBC; where periodic symptom scale scores are used to make treatment decisions) an integrated knowledge translation model and measurement-based care.

Methods: We aim to conduct a feasibility study of a controlled clinical trial comparing an ICP targeting adolescent depression to treatment-as-usual (TAU) across two sites. Feasibility targets include the following: recruitment of 30 participants per site, 95% baseline battery completion rates, 90% adherence to the ICP in the intervention arm, 80% completion of endpoint measures and focus-group feedback that the ICP is user-friendly and helpful. The primary clinical outcome measure for the study is the change in Childhood Depression Rating Scale –Revised (CDRS-R) 1 over 20 weeks. Secondary outcome measures are the change in score on the WHO Disability Assessment Scale 2.0 Child and Youth version (WHODAS-2.0-CY)2 Score and Childhood Behaviour Checklist (CBCL)3 over 20 weeks.

Results: Our overall research program hypotheses are that the ICP will demonstrate greater improvement in depressive symptoms and functioning across all measures relative to treatment as usual.

Implication: Should feasibility targets be met, a multi-centre RCT would be pursued. The ICP is intended to promote true evidence-based care where the evidence, clinician expertise and patient and family values are taken into consideration in the decision-making process.
Full Abstract

Purpose  Co-occurring medical and psychiatric disorders are drivers of the rise in Paediatric hospitalizations and costs. Consultation-Liaison (CL) Psychiatry treats this population in hospital settings. This study describes the profile of the in-patient population served by CL Psychiatry at a Canadian Paediatric hospital.

Methods  Inpatients aged (0-18 years) served by CL Psychiatry are identified between fiscal years 2012/13 and 2016/17 from administrative data. Admissions were characterized into fiscal years based on admit date. Sociodemographic characteristics, utilization volumes, reasons for referral, length of stay (LOS), readmission rates, and resource utilization are analyzed using descriptive statistics.

Results  Admissions requiring CL Psychiatry services increased by 31% in 2016/17 compared to the previous 4 year average. This population was characterized by a LOS that was 3 times longer than the average hospital inpatient (20.3 days vs 6.3 days). The younger age group (<1 year old) was associated with the longest LOS, as compared to the 1-7 or 8-18 year old groups. CL Psychiatry services were most commonly requested by Paediatrics, Neurology, Oncology, Bone Marrow transplant and Critical Care. Psychiatric diagnoses associated with the longest LOS and highest resource intensity were delirium, anxiety, depression, adjustment disorders, post-traumatic stress disorder and somatic symptom and related disorders.

Conclusions/Implications  Improving a service requires an understanding of the needs and complexities of the population served. Findings will help establish hospitalization norms for this population and ensure that hospitals receive adequate funding and mental health resources to help support this severely ill group of patients.
Purpose: The rate at which nicotine is metabolized can be measured by the nicotine metabolism ratio (NMR). Fast metabolizers (FM) tend to smoke more and have a harder time quitting than slow metabolizers (SM). We have previously shown that smoking a cigarette can produce increases in DA in the ventral striatum (VS) and ventral pallidum (VP). Further, DA D2 receptors maybe down-regulated in nicotine dependence. The purpose of the present study was to determine whether SM and FM would have different levels of D2 and/or D3 receptor levels and different smoking-induced increases in DA in the VS and VP.

Methods: Participants (15 FM and 13 SM) underwent two PET scans with [11C]-(+)-PHNO: one after 48 hours of abstinence from smoking, and the other after smoking a cigarette.

Results: D2 receptor levels were approximately 10-13% lower in SM as compared to FM during abstinence (p=0.024); there were no differences in D3 receptor levels. After smoking a cigarette, DA was elevated by approximately 10% in the VS (p<0.001) and VP (p=0.001) of both groups of smokers, with no differences between FM and SM.

Conclusions/Implications: Future studies will need to determine whether these changes are pre-existing or differ as a function of NMR by smoking history.
Purpose: Recent work has suggested that some differences in functional connectivity may be the product of individual differences in cortical spatial organization. The implications of such individualized differences in schizophrenia spectrum disorders (SSDs) has not been previously reported.

Methods: Resting State and anatomical MRI data from patients with an SSD and healthy controls (HC) from three cohorts 1) Centre for Addiction and Mental Health (n=105(SSD),66(HC)) 2) Zucker Hillside Hospital (n=100(SSD),104(HC)) 3) The COBRE (n=25(SSD),53(HC)). We used a newly developed method, Personalized Intrinsic Network Topography (PINT) to identify 80 ROIs on the cortical surface from 6 intrinsic networks using the resting state connectivity in each participant. Functional timeseries were extracted from these 80 personalized cortical ROIs, as well as 80 initial template ROIs for comparison, and correlated with timeseries from 6 striatal subregions defined by Choi et al. (2012).

Results: Using PINT, the correlation between cortical networks (particularly default mode (DM) and ventral attention (VA) networks) and the expected subregions of the striatum was increased in both patients and controls. We observed hypo-connectivity in the SSD compared to control group from striatum to VA network ROIs and hyper-connectivity between striatum and cortical DM both before and after PINT.

Conclusions: In agreement with previous studies, striatal-cortical connectivity showed robust differences between patients and controls, even when individual differences in cortical organization were considered. Our results increase confidence in impairment in striatal-cortical connectivity as a biological marker for SSDs.
Purpose: Cognitive dysfunction affects 40-70% of people with multiple sclerosis (MS). Sex may influence cognition. There is a small literature with some studies1-5, but not others6 reporting greater deficits in men. However, not every study controlled for differences in cognition in the general population and it is unclear whether specific cognitive domains are more vulnerable than others to the effects of sex.

Methods: A chart review was undertaken of 408 people with MS referred to neuropsychological services. Demographic and MS-related variables were extracted from the patients’ records. The neuropsychological assessment entailed the Minimal Assessment of Cognitive Functioning in Multiple Sclerosis. Raw test scores were converted to z-scores using Canadian regression based normative means corrected for age, sex and level of education8. A general linear model was conducted on adjusted scores while controlling for age, years of education, type of MS and EDSS.

Results: The male group consisted of a higher frequency of individuals with primary progressive MS (X2 = 6.415, p = 0.011), but there were no other differences with respect to demographic, neurologic or psychiatric data. Females performed significantly better than males on combined tests of information processing speed (F = 2.980, p = 0.032), verbal memory (CVLT-II total learning: F = 5.357, p = 0.021) and visuospatial processing (F = 8.668, p = 0.003).

Conclusions: An analysis of a large sample of people with MS demonstrated sex differences in cognitive impairment, with men more impaired than women on tests of verbal learning and memory, information processing speed and visuospatial processing.

**Dunlop, Katharine**

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<td>Co-Authors</td>
<td>Sakina Rizvi, University of Toronto, St. Michael's Hospital; Xiamin Leng, University Health Network; Stefanie Hassel, University of Calgary; Stephen Strother, University of Toronto, Baycrest Centre; Glenda MacQueen, University of Calgary; Jonathan Downar, University of Toronto, University Health Network; Sidney H. Kennedy, University of Toronto, University Health Network</td>
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**Full Abstract**

Purpose: Anhedonia is a core feature of major depression. Anhedonia is associated with dysfunction in mesocorticolimbic regions for reward, and high anhedonia on clinical measures is a negative predictor of antidepressant response. However, it is unknown whether anhedonia and brain dysfunction also negatively predicts escitalopram response. Therefore, the aim of this study is to identify predictors of escitalopram response using clinical and fMRI correlates of anhedonia.

Methods: 134 participants were recruited as part of the Canadian Biomarker Integration Network in Depression. Patients underwent 8 weeks of open-label escitalopram treatment. K-means clustering using MADRS scores was used to identify MDD groups with similar patterns of antidepressant response. Using two valid instruments, we assessed anhedonia severity at baseline and at 8-weeks. All participants completed a monetary incentive delay task (MIDT) in the fMRI at baseline, 2-weeks and 8-weeks. All analyses were executed in FSL using default preprocessing and first-level statistics.

Results: Patients clustered into ‘fast’ responders, ‘slow’ responders and non-responders. Slow responders and non-responders reported significantly higher anhedonia relative to fast responders and controls. MIDT fMRI correlates revealed that all groups but escitalopram non-responders displayed significant differences in mesocorticolimbic activation between incentivized and non-incentivized cues during reward anticipation.

Conclusions: These fMRI results indicate that escitalopram non-responders do not distinguish between incentivized and non-incentivized cues during the anticipatory phase of the MIDT; this result likely reflects poor reward learning or incentive salience in those that did not respond to escitalopram. Future work should incorporate genetic and molecular factors of reward processing that may likely impact escitalopram response.
Purpose: This study first compared the prevalence of intellectual and developmental disabilities (IDD) among newcomers and non-newcomers in Ontario, Canada and second assessed how having IDD affected the health profile and health service use of newcomers.

Methods: This population-based retrospective cohort study of adults aged 19-65 in 2010 was conducted in Ontario using linked health and social services administrative data. Data on newcomers was from the Immigration, Refugees and Citizenship Canada database that identifies newcomers to Ontario after 1984. To address the first objective, the prevalence of IDD among newcomers (n=1,649,633) and non-newcomers (n=6,880,196) was compared. For the second objective we compared newcomers with IDD (n=2,830) to newcomers without IDD (n=1,646,803) in terms of health conditions, community service use and hospital service use.

Results: While newcomers represent a lower proportion in the population with IDD than in the general population, newcomers also had a lower prevalence of IDD than non-newcomers (171.6 versus 898.3 per 100,000 adults, p<0.001). Among newcomers, those with IDD had a higher age- and sex-adjusted prevalence of physical, mental health and substance use disorders than those with no IDD. Newcomers with IDD were also more likely than their comparators to use community and hospital based care. Largest differences were in mental health and addictions disorders, and frequent hospital use.

Conclusion: While these results parallel findings that people with IDD are more vulnerable than others in the general population, they also emphasize the need for newcomers with IDD and their families to have access to appropriate supports upon arrival.
Purpose: This study provides a comprehensive picture of adults with a “dual diagnosis” who present to a psychiatric emergency department (ED) and identifies any differences between those admitted and those discharged.

Methods: A retrospective chart review of visits to a psychiatric ED was conducted from Oct 2016 - Nov 2016. Charts of patients with a developmental disability (DD) were reviewed and demographic variables summarized. Potential factors affecting admission were compared using t-tests and chi squares.

Results: A total of 73 patients representing 105 visits were identified. Males presented more often (63%). The largest group of patients lived independently: 25% rented their own home, 12% were in supportive housing and 16% were homeless. Most commonly patients presented to the ED alone (42%). Leading reasons for presentation were suicide spectrum (28%), aggression/agitation (20%), psychosis spectrum (13%). Collateral was sought 43% of the time. The most common diagnoses were a DD (78%), personality disorder (42%), and psychosis (39%). Of these visits 36% were hospitalized. Patients who were admitted had a higher rate of collateral obtained (RR = 2.0, p < 0.01), higher rates of restraint use (RR = 2.5, p < 0.001) and presented with a friend/family member (RR = 2.9, p < 0.01) or the police (RR = 2.3, p = 0.03).

Conclusions: The results of this study have practical implications for psychiatrists working in acute care. Adults with a DD are not uncommon in this setting and are largely unsupported and need to be connected to resources. Collateral should be obtained and their DD needs to be incorporated into their management plan.
Purpose: Neurodevelopmental disorders (NDDs) share many characteristics and frequently co-occur. Irregular functional connectivity (FC) has been associated with individual NDDs but few studies have investigated multiple NDDs together. Additionally, no study has examined different domains of FC across disorders. Here, we examined intrahemispheric, homotopic and heterotopic connections, to determine whether selective connections are impaired across different NDDs.

Methods: Resting-state functional-MRI data from the local Province of Ontario Neurodevelopmental Disorders (POND) study (ASD n=35, OCD n=39, ADHD n=38) was preprocessed to correct for artifacts and subject motion. The Human Connectome Project multimodal parcellation was used to define subject specific cortical regions of interest (ROI). FC strength and temporal stability were generated for each pair of ROIs. Connections were classified as: intra-hemispheric, homotopic or heterotopic. For each measure, a linear mixed-effects model was used to test the effect of diagnosis, connectivity type and their interaction, with connection type modelled as a repeated measure and age, sex and image quality metrics included.

Results: Connectivity strength ($\chi^2(2)=8267$, p<0.001) and temporal stability ($\chi^2(2)=15$, p<0.001) were significantly related to connection type. Post-hoc tests revealed homotopic connections were stronger and trending towards being less temporally stable than other types. No significant effect of diagnosis or interactions between diagnosis and connection type were found (all p>0.05).

Conclusion: Preliminary results indicate that FC of different connectivity types does not differ between children with different NDDs. Future analysis will examine the relationship of cross-disorder symptoms to connection types and whether FC within specific domains relate to clinical symptoms.
Purpose: While mental illness is a risk factor for suicidal behavior and many suicide decedents receive mental health care prior to death, there is a comparative lack of research that explores their experiences of mental illness and care. Suicide notes offer unique insight into these subjective experiences. Our study explores the following questions: “How are mental illness and mental health care experienced by those who die by suicide?” and “What role do these experiences play in an individual’s path to suicide?”

Method: We utilized a constructivist grounded theory framework to select a focus of qualitative analysis, engage in open coding, axial coding, and theorizing of the data. Our sample is a set of 36 suicide notes that explicitly make mention of mental illness and/or mental health care, purposefully selected from a larger sample of 252 notes.

Results: The primary themes from our sample were 1) Negotiating personal agency in the context of mental illness 2) Conflict between self and illness and 3) Experiences of mental health treatment leading to hopelessness and self-blame. These experiences with mental illness and mental health care give rise to exhaustion and a desire to exercise personal agency, both of which can contribute to suicidal behavior.

Conclusions and Relevance: This study highlights unique perspectives by suicide decedents, whose voices and experiences may not have been heard otherwise, addressing a critical deficit in existing literature. Findings from this study deepen the understanding of suicide decedents’ mental illness and experiences of mental health care. These insights can potentially inform clinical care and strengthen suicide prevention programs.
Abstract Title: Microglial Activation and Oxidative Stress in Clinical High Risk for Psychosis: A PET-MRS Study

Co-Authors: Sina Hafizi, CAMH; Tania Da Silva, CAMH; Jeffrey Meyer, CAMH; Michael Kiang, CAMH; Sylvain Houle, CAMH; Gary Remington, CAMH; Ivana Prce, CAMH; Alan Wilson, CAMH; Pablo Rusjan, CAMH; Napapon Sailasuta, CAMH; Romina Mizrahi, CAMH

Co-Presenter: Meng-Chuan Lai, Centre for Addiction & Mental Health, Hospital for Sick Children

Full Abstract:

Purpose: Microglial activation and oxidative stress have both been implicated in the underlying pathophysiology of schizophrenia. To date, several hypotheses have been proposed regarding the link between these two pathological processes in the development of psychosis; however, the molecular mechanisms underlying this interaction are not yet understood. Thus far, no in-vivo study has investigated this link in the human brain. We conducted the first in-vivo study linking TSPO expression and glutathione (as an index of redox status) in medial prefrontal cortex.

Methods: We enrolled 27 antipsychotic-naive individuals at clinical high risk for psychosis and 21 matched healthy volunteers. Microglial activation was quantified using high-resolution PET scanner with [18F]FEPPA, a radioligand that binds to translocator protein 18 kDa (TSPO). Glutathione level was quantified using a 3 Tesla proton magnetic resonance spectroscopy (1H MRS).

Results: We found a significant group interaction suggesting a different relation between microglial activation and glutathione in each clinical group. In healthy volunteers we found a significant negative association between glutathione levels and microglial activation (r = -0.60, p = 0.006). This association was not significant in individuals at clinical high risk for psychosis.

Conclusions: Our results suggest disruption of the connection between microglial activation and oxidative stress in the clinical high risk states for psychosis.
Purpose: Recognizing autism spectrum disorder (ASD) in females is challenging. Many girls and women are undiagnosed, misdiagnosed, or diagnosed later in life compared to males, and experience co-existing conditions (e.g., anxiety, depression) and unmet health care needs. Our objectives were to understand: 1) how ASD presents in girls and women; 2) how ASD-specific and general health care, including diagnosis, are experienced by them; and, 3) what gender-related factors contribute to missed ASD diagnoses and unmet health care needs.

Methods: A qualitative study design was adopted, involving individual and focus group interviews with girls and women with ASD age 12 years and older, and parents/guardians. A thematic analysis was conducted. The themes were reviewed and refined in analytic meetings with the research team and a project advisory group consisting of women with ASD, parents and community stakeholders.

Results: To date, 44 participants have participated in the study. Our preliminary analysis indicates that there are specific presentations of ASD in females (compared to males), which resonates with the emerging literature on gender and autism. In addition, the participants’ accounts suggest that navigating social values and beliefs related to gender and autism played a role in how autism presented in girls and women, and how health care and social interactions were experienced by them. Recommendations for improving health care services for this group were generated.

Conclusions: Understanding the health experiences of girls and women with ASD can inform diagnostic practices and health care pathways to improve access to health care for this population.
Purpose: To determine to what extent access and processes of care explain the relationship between a diagnosis of schizophrenia and death after a myocardial infarction (MI). To determine if individuals with schizophrenia have a differential response to revascularization procedures after myocardial infarction (MI).

Methods: This study used a retrospective cohort study of administrative patient records from Ontario, Canada. Incident MIs were characterized in individuals aged 20-105, and were followed one year post MI discharge. Cox regression models were used to study the effect of schizophrenia on death after MI, after adjusting for the effect of receipt of catheterization and revascularization procedures. Individuals with and without schizophrenia were stratified to understand the impact of revascularization on mortality in these two groups.

Results: Individuals with schizophrenia have greater mortality after MI, with an unadjusted hazard ratio of 1.55 (1.37, 1.77). This increased mortality is attenuated by revascularization to 1.38 (1.20, 1.59) and further attenuated by receipt of catheterization to 1.23 (1.05, 1.43). Revascularization was equally beneficial in schizophrenia with a hazard ratio of 0.400 (0.263, 0.607) compared to a hazard ratio of 0.424 (0.408, 0.442) in those without schizophrenia.

Conclusions and Implications: Individuals with schizophrenia are at increased risk of death from MI, but the increased mortality is reduced by half once adjusted for receipt of treatment. Moreover, revascularization is similarly beneficial in this population. Given these benefits, and the increased burden of cardiovascular disease in these individuals, efforts to improve access to care are essential.
Purpose: Guided by a systematic review, qualitative interviews with healthcare providers and service users, and an expert consensus process, we developed a quality framework (QF) to guide quality measurement and improvement of collaborative mental health care in primary care settings. We present a case study of how two Family Health Teams (FHTs) used the QF to support mental health-related quality improvement (QI) initiatives.

Methods: We conducted 12 interviews with clinicians and administrators involved in QI at two FHTs in Toronto, observed QI committees and other leadership meetings, and incorporated other textual data (e.g. documents, correspondence, and field notes summarizing our observations). We concurrently collected and analyzed these qualitative data sources to understand how each FHT adopted and implemented the QF.

Results: FHT staff identified a number of successes and challenges in developing measures based on our QF and using these measures to drive QI in collaborative mental health care. Although our QF has been received positively by stakeholders involved in primary mental health care, mental health competes with other areas of health to be on the quality agenda. Teams select foci for QI based on alignment with strategic plans and with existing QI initiatives, perceived 'problems'/opportunities for improvement, and perceived feasibility to measure and improve.

Implications: The QF can guide collaborative mental health care teams to plan and implement measurement and improvement initiatives. We anticipate the QF may be transferable to teams across Ontario and Canada wishing to evaluate and improve their collaborative mental health programs.
Full Abstract

Purpose: In terms of response to antipsychotic treatment, patients with schizophrenia can be classified into three groups; (1) treatment-resistant patients who are clozapine (CLZ)-resistant (ultra treatment-resistant schizophrenia [UTRS]), (2) treatment-resistant patients who are CLZ-responsive (TRS), and (3) patients who respond to non-CLZ antipsychotics (treatment non-resistant schizophrenia [TnRS]). The aim of this study was to examine glutamatergic neurometabolite levels in these three patient groups, along with healthy controls (HCs), using proton magnetic resonance spectroscopy (1H-MRS).

Methods: Glutamate (Glu) and glutamate+glutamine (Glx) levels were assessed in the associative striatum (Str), anterior cingulate cortex (ACC), and dorsolateral prefrontal cortex (DLPFC) using 3T 1H-MRS (PRESS, TE = 35ms). Neurometabolite levels were corrected for cerebrospinal fluid proportion.

Results: A total of 100 participants (26 UTRS, 27 TRS, 21 TnRS, and 26 HCs) were included in this study. Patients with UTRS showed higher Glx levels in the ACC compared to HCs (p = 0.038). When patients with UTRS and TRS were combined into one group, this subset of patients showed higher Glu and Glx levels in the ACC compared to HCs (p = 0.028 and p = 0.023, respectively). There were no significant group differences in the Str or DLPFC.

Conclusions: Previous findings reporting higher glutamatergic levels in the ACC of patients with TRS may be mainly influenced by patients with CLZ non-responder. Higher ACC glutamatergic neurometabolite level may be a biological trait of resistance to the first-line antipsychotic treatment that is retained even after CLZ administration.
## Jacobson, Maya

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### Full Abstract

Purpose: The endocannabinoid system (eCBS) is involved in brain responses to stress and cannabis use, both risk factors for psychosis. In vivo imaging studies support an alteration of the eCBS in psychosis, but no studies in the clinical high risk (CHR) for psychosis state are available. We investigated the eCBS in CHR with positron emission tomography (PET) imaging using [11C]CURB, a ligand for fatty acid amid hydrolase (FAAH), the catabolic enzyme of anandamide, a major endocannabinoid.

Methods: Thus far, we recruited 17 healthy volunteers (HV) and 23 CHR individuals. Regional [11C]CURB binding ($k_3$) was calculated using an irreversible 2-tissue compartment model and an arterial plasma input function. All participants tested negative for drugs of abuse at time of study. All analysis was controlled for the participants’ FAAH C385A variant.

Results: [11C]CURB binding was reduced in a priori regions dorsolateral prefrontal cortex (DLPFC; $F=8.339$, $p=0.006$) and striatum ($F=7.148$, $p=0.016$), and in exploratory regions medial prefrontal cortex (mPFC; $F=6.356$, $p=0.057$), anterior cingulate cortex ($F=7.267$, $p=0.011$), and hippocampus ($F=9.692$; $p=0.047$), in CHR versus HV. Analysis revealed a main effect of past cannabis exposure on [11C]CURB binding in the DLPFC ($F=4.696$; $p=0.043$), striatum ($F=8.921$; $p=0.007$), amygdala ($F=4.982$; $p=0.037$), and hippocampus ($F=5.786$; $p=0.026$), and a positive correlation between [11C]CURB binding in the striatum and Calgary Depression Scale scores ($r=0.463$; $p=0.026$), in CHR.

Conclusions: This is the first exploration of FAAH in CHR. This study suggests the eCBS might be alerted in CHR, and could be related to past cannabis use and depression.
Purpose: According to Beck's cognitive specificity hypothesis, each mood and anxiety disorder has its own specific underlying cognitive vulnerabilities that lead to the onset and/or maintenance of symptoms. In contrast, transdiagnostic research has emphasized commonalities rather than distinctions between conditions. The purpose of the present study was to compare these two models by studying three cognitive vulnerability factors in their ability to predict symptom change across CBT treatment in three different conditions: is change in each disorder associated with a single cognitive factor or is change predicted by multiple factors across disorders?

Method: Participants (N = 337) with major depressive disorder (MDD; N = 174), panic disorder with/without agoraphobia (PD/A; N = 66), and obsessive compulsive disorder (OCD; N = 97) completed measures of perfectionism, anxiety sensitivity, obsessive beliefs, and disorder-specific symptom severity at pre- and post CBT treatment. Latent difference score analysis was used to determine the relative contribution of cognitive factors in relation to symptom outcomes.

Results: Perfectionist attitudes alone predicted improvement in depressive symptoms in the MDD group, γ = 5.0, p < .05; anxiety sensitivity alone predicted reductions in anxious arousal symptoms in the PD/A group, γ = 0.35, p < .01; obsessive beliefs alone predicted change in OCD symptoms in the OCD group, γ = 0.37, p < .05.

Conclusions/implications: The current findings provide support for relative disorder-specific cognitive effects in the prediction of CBT treatment outcomes when directly tested within and between different disorders.
Objective: This study was designed to provide a representative description of the mental health of youth accessing homelessness services in Canada. It is the most extensive survey in this area to date and is intended to inform the development of mental health and addiction services and policy for this marginalized population.

Methods: This study reports mental health–related data from the 2015 “Leaving Home” national youth homelessness survey, which was administered through 57 agencies serving homeless youth in 42 communities across the country. This self reported, point-in-time survey assessed a broad range of demographic information, pre-homelessness and homelessness variables, and mental health indicators.

Results: Survey data were obtained from 1103 youth accessing Canadian homelessness services in the Nunavut territory and all Canadian provinces except for Prince Edward Island. Forty-two per cent of participants reported 1 or more suicide attempts, 85.4% fell in a high range of psychological distress, and key indicators of risk included an earlier age of the first episode of homelessness, female gender, and identifying as a sexual and/or gender minority (lesbian, gay, bisexual, transgender, queer, and 2 spirit [LGBTQ2S]).

Conclusions: This study provides clear and compelling evidence of a need for mental health support for these youth, particularly LGBTQ2S youth and female youth. The mental health concerns observed here, however, must be considered in the light of the tremendous adversity in all social determinants faced by these youth, with population-level interventions best leveraged in prevention and rapid response.
Purpose: Schizophrenia is a psychiatric illness that affects approximately 1% of the world’s population. Impaired insight is a common feature of schizophrenia that negatively contributes to medication adherence and clinical outcomes. Currently, there are no established treatment strategies to improve insight. The proposed study will investigate the effects of transcranial direct current stimulation (tDCS) as an adjunctive treatment to improve insight in patients with schizophrenia by targeting a brain region implicated in impaired insight (i.e. posterior parietal area).

Methods: Participants with schizophrenia or schizoaffective disorder with moderate-to-severe impairment in insight (< PANSS G12) were included. All participants were randomized to receive either active bi-parietal (anode right/P4, cathode left/P3) or sham tDCS twice-daily for 10 days across 2 weeks. Each participant received functional MRI scans pre- and post-tDCS. Insight was measured using the VAGUS Insight into Psychosis Scale pre- and post-tDCS, and weekly thereafter for 4 weeks.

Results: A total of 10 participants were included and 5 received active and 5 received sham tDCS. Active tDCS significantly improved insight into psychosis (t=2.40, p=0.043, effect size Cohen’s d=1.52) compared to sham tDCS. A trend toward a significant effect was observed during the follow-up period (t=2.19, p=0.071, effect size Cohen’s d=1.55 at follow-up visit 2).

Conclusions/Implications: Although preliminary, these findings suggest that tDCS may be a feasible approach to improve insight in patients with schizophrenia. The results of this study will provide justification for larger treatment-controlled studies to determine if tDCS is a practical means of producing meaningful clinical effects.
Purpose: Integrated Care Pathways (ICPs) comprising structured treatment algorithms, measurement-based clinical decisions, and multidisciplinary teams are urgently required in psychiatry and primary care to implement current evidence and improve access to care and clinical outcomes for patients suffering from mood disorders.

Methods: We have developed ICPs based on actual guidelines and therapy algorithms and have implemented these structured care models for Major Depressive Disorder (MDD) and Bipolar Disorder (BD) in the Mood and Anxiety Ambulatory Services (MAAS) at CAMH over the past two years. These ICPs consist of comprehensive assessment and structured treatment algorithms including pharmacotherapy, psychotherapy and brain stimulation. Further important directions are integration of social support systems and physical health aspects.

Results: Evaluation of the clinical pilots of MDD and BP ICPs, which are now completed, will provide first valuable insights on clinical implementation, acceptance by care providers and patients, access to care, and outcomes, and will facilitate refinement, distribution and large-scale implementation of these structured care models.

Conclusions/Implications: Next steps include implementation of Mood disorder ICPs as standard model of care in MAAS receiving over 5000 new patient referrals per year and establishment of ICPs as shared care model in collaboration with community healthcare providers in the province. Evaluation and implementation of clinical and biological indicators are major future goals of this initiative. We anticipate that broader implementation of Mood disorder ICPs will improve access and outcomes in MDD and BD and will provide a platform for clinical research ranging from biomarker research to innovative clinical trials.
Purpose: Antipsychotics are the gold-standard treatment for schizophrenia but cause serious metabolic side-effects. The hypothalamus is the primary brain region responsible for energy regulation, and disruptions in hypothalamic energy sensing and inflammation are implicated in insulin resistance and obesity. Thus, hypothalamic inflammation and disturbed energy sensing could be involved in antipsychotic-induced metabolic disturbances, yet direct effects of antipsychotics on the hypothalamus have yet to be examined.

Methods: The rat hypothalamic cell line, rHypoE-19, was treated with olanzapine, clozapine, or aripiprazole. Western blotting was used to measure the energy sensing protein AMPK, components of the insulin signaling pathway (AKT, GSK3B), and components of the MAPK pathway (ERK1/2, JNK, p38), the latter linked to inflammation. qRT-PCR was performed to determine changes in the mRNA expression of IL-6, IL-10, and BDNF.

Results: Olanzapine and clozapine increased pERK1/2 and pJNK, while aripiprazole increased pJNK. Clozapine and aripiprazole increased pAMPK and inhibited insulin-induced pAKT. Olanzapine increased IL-6 while aripiprazole decreased IL-10. Olanzapine and aripiprazole increased BDNF expression. Clozapine did not change BDNF, IL-6, or IL-10.

Conclusions: Upregulation of pJNK alongside olanzapine-associated increases in IL-6, and aripiprazole-associated decreases in IL-10, suggests upregulation of pro-inflammatory pathways. Aripiprazole and clozapine inhibited insulin-stimulated pAKT and increased pAMPK, suggesting impaired hypothalamic insulin action. Conversely, olanzapine and aripiprazole increased BDNF, a factor linked to the etiology of schizophrenia, suggesting BDNF upregulation as a mechanism of therapeutic action. Overall, our findings suggest highly differential effects of antipsychotics on hypothalamic neuroinflammation and energy sensing, which do not align with the known metabolic liability of these agents.
**Purpose:** Genetic evidence implicates complement pathway activity as a cause of Alzheimer’s disease (AD); however, reports of complement proteins measured in peripheral blood and cerebrospinal fluid (CSF) have conflicted. This meta-analysis seeks to quantitatively summarize the peripheral blood and CSF complement pathway data.

**Methods:** Literature was searched using Medline, PubMed, Embase, PsycInfo, Cochrane Controlled Trials Register, and Cochrane Database of Systematic Reviews. Original peer-reviewed studies measuring complement and complement regulator protein concentrations in AD and healthy control subjects were included. Mean (± standard deviation) concentrations for AD and control subjects were extracted and combined in random effects models.

**Results:** 69 studies measuring either CSF or peripheral blood protein concentrations have been included thus far. Preliminary results show an increase in clusterin concentrations in CSF (N=437/371, Z=4.18, p<.001; I²=31%) and plasma (N=1269/1651, Z=2.04, p=.02; I²=97%) in AD compared to healthy elderly, and a nominal difference in CSF serum amyloid P levels (N=143/79, Z=1.95, p=.05; I²=0%) between AD and healthy elderly.

**Conclusions/Implications:** Complement proteins are elevated in AD blood and CSF; since clusterin inhibits the activity of complement proteins at the end-stages of the complement cascade, the results implicate increased complement activity, but also increased negative complement regulation, in AD.
# Semantic priming deficits in persons at clinical high risk for schizophrenia: evidence from event-related brain potentials

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**Background:** Persons exhibiting clinical high-risk (CHR) symptoms similar to but milder than those of schizophrenia have an elevated risk of developing this disorder. We sought evidence that CHR patients process relationships between meaningful concepts abnormally, similar to what has been observed in schizophrenia, and that these abnormalities are related to psychosis-like symptoms. To probe how meaningful stimuli activate related concepts in semantic memory, we measured the N400 event-related potential (ERP) response. We hypothesized that the normal reduction in N400 amplitude for stimuli that are more related to a preceding one is decreased in CHR patients, and that this abnormality correlates with psychosis-like symptoms.

**Methods:** We recorded ERPs in 16 CHR and 16 healthy control participants who viewed prime words followed at either 300- or 750-ms stimulus-onset asynchrony (SOA) by targets which were either words related or unrelated to the prime, or pronounceable nonwords. Participants' task was to indicate whether or not the target was a word. Patients' psychosis-like symptoms were assessed with the Structured Interview for Psychosis-Risk Syndromes.

**Results:** Consistent with our hypothesis, across SOAs, N400 amplitudes were larger (more negative) for unrelated than related targets in controls, but did not differ between these conditions in patients (Tukey HSD familywise a<0.05). Across patients, smaller N400s for unrelated targets at the short SOA correlated with suspiciousness/persecutory ideation (Spearman’s r=0.66, p=0.008).

**Conclusions:** Persons in early stages of the developmental trajectory to psychosis appear to process related and unrelated stimuli more similarly than normal. This abnormality may represent a neurophysiological mechanism of the development of delusions.
Purpose: This study examined cognitive performance and functioning in untreated depressed patients assessed at baseline and following treatment with an antidepressant after 8 weeks.

Methods: The CANBIND (Canadian Biomarker Integration Network for Depression) study assessed cognition using CNS Vitals as well as functional measures at baseline and at 8 weeks in an untreated depressed sample (MADRS score ≥ 24). Functioning was assessed by the Sheehan Disability Scale (SDS) and Lam Employment, Absence and Productivity Scale (LEAPS). All patients received escitalopram 20mg for 8 weeks while healthy controls received placebo. We hypothesized that patients (n=184) would have greater baseline deficits in cognition relative to healthy controls (n=95) and that improvements in cognition would be associated with a greater degree of functional improvement.

Results: Baseline cognitive impairment was evident in the depressed sample with the domains of memory, psychomotor speed, attention and cognitive flexibility statistically significantly impaired relative to controls. No baseline cognitive measure was correlated with baseline functioning. In linear regression modeling, baseline depression severity (t=4.5, p=0.0001) and baseline reaction time (t=-2.2, P=0.03) predicted baseline LEAPS while baseline memory predicted baseline disability. Severity of depressive illness correlated with neuropsychological impairment. Cognition improved over the 8 week period. Improvement in psychomotor speed was correlated with improved work productivity (r= -.03, P=0.01) but not disability.

Conclusions: Cognition improved in depressed patients following antidepressant treatment and individual domains were associated with increased productivity and less functional disability. Future research will focus on how antidepressant augmentation could provide additional benefits to productivity and functioning.
Purpose: The objective of this study is to describe the psychosocial services offered to depressed children and youth across Ontario. A secondary objective is to examine youth and caregiver engagement in treatment across contexts.

Methods: A total of 1357 program managers or equivalent staff responded in a survey about their program’s services for youth depression. Respondents provided information about mental health concerns, treatments offered, youth engagement and drop-out rates, as well as referrals and evaluation methods used by each agency.

Results: A total of 1037 respondents (76% response rate) representing 1937 programs (77% of total provincial programs) and 442 agencies (84% of agencies identified across Ontario) completed the survey. Majority of agencies were urban (57%), providing services for youth 18-25 years of age (79%) including assessment, individual therapy, group therapy, case management, psychoeducation, day treatment as well as in-patient services. A map has been created to observe the distribution of services, to our knowledge, the first provincial map of this kind. More than one third of participants reported a discontinuation rate of > 25% among service users. Referral sources and evaluation methods are reported.

Conclusions: Program managers are engaged in providing diverse services for youth with depression. Diverse services are being provided in Ontario with respect to the age group of services users, geographical area, and the types of services. Multiple program evaluation methods are in place. Next steps include exploring youth and caregiver expectations and experiences with psychosocial services for child and youth depression.
Purpose: Atypical neurodevelopment may confer vulnerability to anorexia nervosa (AN), a highly heritable psychiatric disorder, risk factors for which include perinatal complications and childhood trauma. However, efforts to identify structural correlates thereof are complicated by competing effects of starvation. As such, this study aims to characterize state-dependent and trait-based variations in cortical surface architecture and white matter microstructure by comparing acutely-ill (acAN) and long-term, weight-recovered (recAN) patients to healthy controls (HC).

Methods: DTI (60 gradient directions) and MRI data were acquired on a 3T GE scanner. FSL and FreeSurfer processing pipelines were used to test main effect of group on voxel-wise, brain-wide fractional anisotropy (FA) and mean diffusivity (MD), indices of white matter microstructure, and vertex-wise, cortex-wide thickness (CT), surface area (CSA), and local gyrification index (LGI), respectively. Posthoc pairwise comparisons were tested with analyses of covariance including age and/or intracranial volume as nuisance variables.

Results: Imaging data was collected from 71 adult women (23 acAN, 24 recAN, 24 HC). Analyses thereof revealed significant group differences in: [1] peak MD in the corpus callosum (acAN, recAN > HC); [2] mean CT in frontal and temporal regions (acAN < recAN, HC); and [3] mean LGI in frontal and parietal regions (acAN, recAN < HC). We did not detect a significant main effect of group on peak FA or mean CSA.

Conclusions/Implications: Whereas cortical thinning appears to be a consequence of starvation, differences in white matter microstructure and cortical gyrification may emerge early in development and confer vulnerability to AN.
Purpose: Structural covariance networks have been shown to recapitulate functional network architecture (Nestor 2017), are disrupted in neurodegenerative diseases and are associated with experience-based plasticity (reviewed in Evans 2013). We assessed whether a structural covariance system could differentiate persons with Major Depressive Disorder (MDD) versus non-depressed controls.

Methods: 268 subjects with MDD were selected from a randomized non-inferiority trial to assess high-frequency versus theta-burst rTMS (ClinicalTrials.gov no. NCT01887782). A series of non-depressed controls (n=71) were also acquired. Each subject had a 3D T1-weighted, 3.0 Tesla MRI acquired at baseline. Cortical thickness (CT) maps were computed from T1 MRI using Freesurfer. Thickness maps were submitted to a singular value decomposition to identify systems of CT covariance and compare these patterns amongst groups. Significance testing was performed using permutation and bootstrap analyses. Subject-wise covariance network integrity scores were computed and submitted to a GLM. Network Integrity scores indicated the degree that an individual expressed the group-level covariance network.

Results: A covariance network was found that differentiated controls from MDD (P<0.001). Covariance network scores were significantly lower (indicating reduced integrity) in MDD versus controls (P<0.001).

Conclusions: These results suggest that a structural covariance signature of depression could be used to distinguish persons with MDD from non-depressed and future work should examine these network measures to predict response to treatment in therapeutic trials.
Purpose: Subjective memory concern in older adults with normal cognitive performance is associated with increased risk of Alzheimer’s disease (AD) but the mechanisms underlying this relationship are unknown. Evidence suggests emotional dysregulation may occur in the earliest stages of AD. In the current study, we assessed the association between subjective memory and attention towards threat in cognitively normal older adults. Based on our hypothesis of emotional dysregulation as an early biomarker of AD, we predicted that subjective memory decline would be correlated with attentional bias towards threat.

Methods: Participants were 32 older adults (26 females, mean age = 72, SD = 6.7, mean MoCA = 26.7, SD = 1.9) with normal performance on neuropsychological assessment. Participants completed the Memory Functioning Questionnaire (MFQ) as a measure of subjective memory and a face rating task which required judging the width of faces with threatening or neutral expressions. Attention towards threat or “threat bias” was operationalized as longer response latencies to rate the width of threatening, relative to neutral, faces.

Results: Report of mnemonic use (MU) on the MFQ was significantly correlated with threat bias ($r = .50, p = .004$) and with reduction of threat bias over time ($r = .45, p = .009$). No associations between threat bias and objective memory performance or other MFQ measures were detected.

Conclusions: These findings are consistent with previous studies showing a relationship between emotion regulation and use of mnemonic strategies in older adults. Future work is needed to clarify the direction of this association.
**Abstract Title**: Lower- and higher-level social cognitive factors across people with schizophrenia spectrum disorders and healthy controls: Relationship with functional outcome and negative symptoms

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**Full Abstract**: Purpose: Schizophrenia spectrum disorders (SSDs) often feature social cognitive deficits. However, little work has focused on the factor structure of social cognition, and results have been inconsistent in schizophrenia. Our objective was to elucidate the factor structure of social cognition across participants with SSDs and healthy controls. We hypothesized that a two-factor model, including lower-level “simulation” and higher-level “mentalizing”, would demonstrate the best fit across participants.

Methods: 164 participants with SSDs and 102 healthy controls completed social cognitive tasks ranging from emotion recognition to complex mental state inference, and clinical, functional outcome, and neurocognitive measures. Structural equation modeling was utilized to test social cognitive models, models of social cognition and neurocognition, measurement invariance between patients and controls, and relationships with outcome measures.

Results: A two-factor (simulation, mentalizing) social cognitive model fit the data best across participants (RMSEA = 0.00, CFI = 1.00), and showed adequate measurement invariance in both SSD and control groups. Patients showed lower simulation and mentalizing scores than controls (p < .001), but only mentalizing was significantly associated with negative symptoms and functional outcome (p < .05). Social cognition also mediated the relationship between neurocognition and both clinical and functional outcome measures (p < .05).

Conclusions: Our results indicate that distinct lower- and higher-level aspects of social cognition exist across SSDs and healthy controls. Further, mentalizing may be particularly linked to negative symptoms and functional outcomes. This informs future studies of the neural correlates of social cognition and the development of targeted treatments for improving functional outcome.
Purpose: To examine the association of both neurodevelopmental disorder (NDD) categorical diagnoses and dimensional NDD traits cutting across diagnoses on adaptive functioning.

Methods: Study data were obtained from the Province of Ontario Neurodevelopmental Disorders (POND) Network. Sample consisted of 2258 participants aged 3 - 18 years who are typically developing (n=364) or have clinical categorical diagnoses of ASD, ADHD, OCD, or ID. Behavioural variables-of-interest were obtained from psychometrically validated subscales of Social Communication Questionnaire (SCQ), Repetitive Behaviors Scale–Revised (RBS-R), Toronto Obsessive-Compulsive Rating Scale (TOCS), Strengths and Weaknesses of ADHD Symptoms and Normal Behavior Rating Scales (SWAN), and Child Behavior Checklist (CBCL). Adaptive functioning in conceptual, practical, and social domains was measured by the Adaptive Behavior Assessment System, 2nd Edition (ABAS-II). Elasticnet regularized regression was performed in R. False discovery rate correction was performed on approximate t-statistics to identify significant correlates across all regression outcomes.

Results: Having an ASD diagnosis and exhibiting higher levels of inattention were significant correlates of poorer adaptive functioning across all three domains. Severity of restricted interests in behaviour (measured by RBS-R) and repetitiveness (measured by SCQ) both had significant negative effects in conceptual and social domains.

Conclusions/Implications: An ASD diagnosis and dimensional traits of inattentiveness and repetitiveness are most associated with poorer adaptive functioning in children and youth. Increased understanding of adaptive functioning and specific correlates across NDDs can lead to better clinical assessment, tailored interventions, and improved transition to adulthood for children and adolescents with NDDs.
Purpose: Investigate the effects of CACNA1C rs1006737 on cortical and subcortical structural neuroimaging phenotypes in bipolar disorder (BD) and healthy control (HC) adolescent participants.

Methods: Seventy-one adolescents (14-20 years; 38BD, 33HC) underwent 3-Tesla Magnetic Resonance Imaging (MRI). T1-weighted images were processed using FreeSurfer. Region of interest (ROI) and whole-brain vertex-wise analyses examined cortical volume, surface area (SA), and thickness, as well as subcortical volume. ROIs included the ventromedial prefrontal cortex (vmPFC), ventrolateral prefrontal cortex (vLPFC), anterior cingulate cortex (ACC), putamen, and amygdala. General linear models included main effects of diagnosis and rs1006737, and an interaction term, controlling for age, sex, and total intracranial volume.

Results: Vertex-wise analysis found significant diagnosis-by-rs1006737 interactions for prefrontal and occipital brain structure such that BD A-carriers were found to have greater SA relative to BD non-carriers, while HC A-carriers had reduced SA relative to HC non-carriers. ROI analysis found an interaction in the ACC such that BD A-carriers were found to have greater SA relative to BD non-carriers, while no significant difference was found in HCs. Main effects of rs1006737 were also found on ACC SA from ROI analysis, and occipital SA from vertex-wise analysis, such that A-carriers had larger SA relative to non-carriers in both of these regions.

Conclusions/Implications: The current study identified putative neurostructural intermediate phenotypes relevant to the impact of CACNA1C rs1006737 on adolescent BD. Further investigation is warranted into the neural, neurovascular, and neurocognitive relevance of rs1006737 associations with BD-specific elevations in regional SA.
Purpose: There is insufficient knowledge regarding outcomes for forensic patients residing in the community and who eventually cease to be supervised by the forensic mental health system (FMHS). Consequently, there is little on which to inform public perception regarding the risk of harm posed by such persons, or to create effective care and risk management plans. This study investigates the prevalence of clinical outcomes prompting hospital readmission among forensic patients at key points of transition: initial hospital discharge, conditional and absolute (unconditional) discharge from the FMHS.

Methods/Results: Using a prospective design including follow-up interviews and records review (N = 87 [data collection is ongoing]), we found that 28% of patients were readmitted on one or more occasions within 12 months of initial hospital discharge. Psychiatric decompensation, substance use, and treatment non-adherence were the central reasons prompting readmission. Patients with one or more readmissions were found to have spent significantly more time under the FMHS and were more likely to have a substance use disorder. In the year following absolute discharge, rates of medication non-compliance, hospital readmission and violence increased as compared to the year preceding absolute discharge (ORs = 3.51-10.41). Discharged patients who reoffended (16%) were characterized by greater substance use problems.

Conclusions/Implications: Results replicate prior findings of low rates of serious violence among community-dwelling and absolutely discharged forensic patients, and substantiate the centrality of substance use as a clinically important treatment target. Findings have relevance to identifying those who may have higher clinical needs at key points of transition.
**Full Abstract**

**Purpose:** Reading disability (RD) is the most common neurodevelopmental disorder affecting children in North America. Although RD is known to be a complex genetic trait, associated genes largely remain unknown and unreplicated. We sought to identify genetic variants associated with reading by performing genome wide association (GWA) analyses on 5253 individuals from two samples.

**Methods:** The primary sample is a family-based RD selected sample from Toronto and the secondary is a population-based unselected sample named the Philadelphia Neurodevelopmental Cohort (PNC). Samples were previously measured for word reading ability and genotyped. We performed quality control analysis, imputation and association analyses. We hypothesized the majority of our top associated SNPs would be in novel genes or genes associated with RD related comorbidities.

**Results and future directions:** top associated SNPs from Toronto and PNC samples were found in genes (NRCAM, BIN1, KANSL2, and CCNT1) that are associated with other neurodevelopmental disorders/transcriptional processes. These SNPs are located in enhancer regions. Enhancers modulate transcription in a cell-type specific manner. We further hypothesize that RD associated SNPs may alter enhancer function leading to altered gene expression. We are testing top associated SNPs' effect on enhancer function in neural precursor cells using a luciferase reporter assay. We also found a variant (rs2071267) in BIN1 which is predicted to be a splice site. We are testing for alternatively spliced isoforms associated with this variant in our RD samples.

**Conclusion:** This will contribute to a better functional understanding of variants associated with RD as well as associated neurodevelopmental disorders.
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Abstract Type
Oral Presentation

Research Theme
Alzheimer's Dementia, Late life depression

Abstract
A Comparison of Neural Circuitry in Older Persons with Late-Life Depression, Mild Cognitive Impairment, Alzheimer's Dementia, and Normal Cognition

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Full Abstract
Purpose: The pathways linking late-life depression (LLD), mild cognitive impairment (MCI), and Alzheimer's Dementia (AD) are complex and bidirectional. We investigated neural circuitry associated with the executive-control network and the corticolimbic network because changes in both networks have been implicated in these disorders.

Methods: T1-weighted and diffusion tensor imaging scans for 282 participants from five groups: history of major depression (LLD; n = 43), LLD+MCI (n = 43), MCI (n = 122), AD (n = 39), and aging controls (n = 35) were acquired using the same acquisition sequences on a 3T scanner. We compared cortical thickness, subcortical volumes, white matter fractional anisotropy (FA), and mean diffusivity (MD) in the executive-control (EC) and corticolimbic (CL) networks across the five groups using an ANOVA and GLM model (Age*Diagnosis, with sex as a covariate).

Results: The AD group demonstrated significant decreases in cortical thickness, subcortical volume, and FA (with increases in MD) in all networks. The other four groups did not differ significantly in their hippocampal volumes, entorhinal and frontoparietal cortex thickness, and FA or MD of the cingulum bundle and genu of the corpus callosum.

Conclusion: AD was associated with deleterious changes in EC and CL networks. By contrast, the four other groups did not differ significantly. We attribute this surprising finding to the heterogeneity among our participants. Using more sophisticated measures of brain network architecture or further clinical subtyping might uncover additional differences in brain circuitry.
Purpose: Dopamine hyperactivity in striatum is associated with psychotic symptoms and both stress and cannabis are risk factors for the development and relapse to psychosis. Recently, we reported that subjects at clinical high risk for psychosis (CHR) exhibit a higher striatal dopamine response to acute stress compared to healthy volunteers (HV) and that chronic cannabis use results in a decreased dopamine response in CHR. However, it is unknown if this abnormal dopamine response to stress extends to the prefrontal cortex (PFC), a brain region involved in regulating cognition and stress response. Therefore, we investigated the effect of acute psychosocial stress on (dorsolateral and medial) PFC dopamine in CHR with and without cannabis use using [11C]FLB457 positron emission tomography (PET) and a validated stress challenge.

Methods: Thirty-five participants completed two [11C]FLB457 PET scans (14 CHR without cannabis use, 8 CHR chronic cannabis users (CHR-CU) and 13 HV), one while performing a Sensory Motor Control Task (control) and another while performing the Montreal Imaging Stress Task (stress). Binding potential (BPND) was estimated using Simplified Reference Tissue Model. Dopamine release was defined as percent change in BPND between control and stress scans (ΔBPND).

Results: Stress-induced dopamine release was significantly different between group in medial PFC (F(2,34)=4.44, p=0.020). While CHR did not differ from HV (p=0.78), CHR-CU showed lower dopamine release in response to stress (p=0.017).

Conclusions/Implications: Given the global trend to legalize cannabis, this study is important as it highlights the effects of chronic cannabis use on PFC dopamine function in high-risk youth.
Purpose: Abnormal levels of glutamate/glutamine (Glx) are increasingly implicated in various psychopathologies. While many psychiatric diagnoses are associated with lower levels of Glx, findings from animal studies suggest that aggression is associated with elevated levels of brain Glx. Here, we addressed the question of whether elevated levels of Glx could be seen in humans with antisocial personality disorder (ASPD) - a condition commonly associated with violence and aggression.

Methods: We recruited 18 individuals with ASPD and 24 healthy controls. In addition, we included 16 individuals with bipolar disorder (BD) as clinical controls, since high levels of Glx have also been found in this group. We used proton magnetic resonance spectroscopy to image dorsolateral prefrontal cortex (dLPC) and anterior cingulate cortex (ACC), two brain regions that are associated with emotional processing and behavior control. The data were processed using LCModel and corrected using Matlab.

Results: We found significantly elevated levels of Glx in the ASPD group relative to the control groups in the dLPC (p = 0.03), and a positive correlation between Glx levels and aggression, measured using the Buss-Perry aggression questionnaire, in dLPC in the ASPD group alone (r = 0.66, p = 0.04). There were no differences between the BP and healthy control group.

Conclusion: These findings show, for the first time, a link between aggression in ASPD and Glx levels. The findings could have implications for the treatment and management of violent behavior, and further studies of neurometabolite concentrations in forensic populations are warranted to address these questions.
Purpose. The PRIDE project uses the Model for Improvement to improve collaborative care of depression in the St. Michael’s Academic Family Health Team, with an initial focus on people experiencing co-morbid depression and diabetes (DDM). The collaborative chronic care model (involving team-based, measurement-informed, evidence-based, population-oriented care) has been demonstrated to improve DDM care processes and outcomes.

Methods. First aim: by September 2018, 80% of known DDM patients at the St. Jamestown site will complete at least one PHQ-9 scale. Initial Plan-Do-Study-Act (PDSA) cycles describe the current quality problem and explore healthcare providers’ perspectives. We searched the electronic health record and used descriptive statistics of DDM care and outcomes in the past year. We interviewed 15 healthcare providers representing diverse professions and roles.

Results. Seventeen percent of St. Jamestown patients with diabetes have known current or past depression (n = 63 / 366). Although 96.8% of DDM patients were seen in clinic only 3.2% completed a PHQ-9 in the past year, and only 25.4% ever completed one. Healthcare providers perceived obstacles to using the PHQ-9: time, remembering, patient acceptance, language and literacy barriers, and concern about how to meet the needs of symptomatic patients. Change ideas included PHQ-9 completion in the waiting room (on paper or tablet), via email or telephone, or during diabetes care visits.

Implications. There is substantial room to improve measurement-based care for depression in the SMAFHT. Subsequent PDSAs will develop an initial intervention to fit existing workflows, elicit patient feedback, and audit charts in detail to explore other depression care processes.
**Abstract Title**
Increasing Clinical Research Recruitment through the CLEARR (Clinical Engagement and Research Recruitment) Model

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**Full Abstract**

Purpose: Recruitment for clinical research is often a slow and inefficient process leading to inadequately powered results and early abandonment of studies. Barriers include difficulty of physician research engagement on top of existing clinical duties and poor communication between clinical and research teams. The Clinical Engagement and Research Recruitment (CLEARR) model was implemented to improve recruitment into clinical research studies.

Methods: CLEARR establishes a pre-screening process for all incoming patients to CAMH for potential candidates to available research studies. The consulting physician is then informed and can discuss the particular research study with their patient and ask for consent to be contacted by the study research assistant. We examined the recruitment data of one randomized trial (the GAPP study) in the period before and after the implementation of CLEARR.

Results: From March 2016-March 2018, the mood and anxiety division had 6,463 new referrals pre-screened resulting in 113 enrolled, and our first episode psychosis program 228 referrals pre-screened and 65 enrolled. The geriatric psychiatry division where a CLEARR-like model had been in use since 2012 had 2,647 new referrals pre-screened and 398 enrollments between April 2016-October 2017. The GAPP screened a monthly average of 4 and enrolled 2.4 prior to CLEARR. After the implementation of CLEARR, a monthly average of 38.2 patients were pre-screened, 18.3 screened, and 9.1 enrolled.

Conclusions: CLEARR is an innovative research recruitment model that demonstrated a substantial increase in research screening and enrollment in research studies. Increasing recruitment potential will greatly improve research productivity in our institution.
Purpose: In individuals with schizophrenia, suicide accounts for 5% of deaths. Suicidal ideation is prevalent, and emergent suicidal ideation is a particular cause for concern. Recent stressful life events affect suicidal behavior, but studies on schizophrenia populations focusing on suicidal ideation and stressful life events are lacking. Thus, we analyzed the effect of recent stressful life events on emergent suicidal ideation in schizophrenia.

Methods: Individuals with schizophrenia spectrum disorders were assessed at 2 visits: baseline and 3-month follow-up. Suicidal ideation was assessed at both visits by the Columbia-Suicide Severity Rating Scale (C-SSRS). Emergent suicidal ideation was defined as a higher suicidal ideation score at follow-up. The Social Readjustment Rating Scale (SRRS), modified to assess events in the past three months, was administered at follow-up. The stressful life event total score was the sum score for all SRRS items, while domain scores were the sum scores for specific items in the interpersonal, finance, legal, work, and health domains. Logistic regression was used to determine the effect of the total scores and domain scores on emergent suicidal ideation.

Results: There were 139 individuals in the analysis. 11% of them had emergent suicidal ideation, including 67% females. Higher scores in the health domain were predictive of emergent suicidal ideation (OR=1.032, 95%CI=1.015-1.1049, p=0.0002).

Conclusions/Implications: In individuals with schizophrenia, health problems are associated with a modest increase in the risk for emergent suicidal ideation. Thus, incorporating a holistic healthcare assessment for these individuals, including at their visits for mental health assessments, is warranted.
Purpose: Over the past three decades, research has accumulated regarding anomalous cerebral blood flow in bipolar disorder (BD). The study of cerebrovascular function using neuroimaging CBF phenotypes could inform our understanding of the pathophysiology of BD. Indeed, there is increasing support for the concept that BD is in part a vascular disease. Despite numerous studies, there has not yet been a review of the literature on the topic of CBF in BD.

Methods: A systematic review of the literature was performed using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). Studies included measured CBF by single-photon emission computerized tomography (SPECT), positron emission tomography (PET), arterial spin labelling (ASL), perfusion weighted imaging (PWI), or transcranial doppler in a distinct group of BD patients.

Results: Thirty-three studies with a total of 533 subjects with BD were included. The majority of studies in BD depression and mania reported widespread resting hypoperfusion in cingulate gyrus, frontal, and anterior temporal regions in comparison to HC. Findings in euthymic BD subjects and in heterogeneous groups were less consistent, in the context of limited number of studies. Those studies that have examined CBF response to cognitive and emotional stimuli in BD subjects have reported hypoperfusion or different regions involved in comparison to HC.

Conclusions/Implications: Based on this preliminary literature, the most consistent finding is hypoperfusion in BD-depression and hyporeactivity to emotional and cognitive challenges. Future studies examining the CBF-CVD link and examining CBF as a treatment target are warranted.
Purpose: A decreased ability to inhibit a speeded motor response is a well-studied endophenotype in Attention Deficit Hyperactivity Disorder (ADHD), with prior documented differential brain network activation revealed using F-MRI together with the Stop Signal Task (SST). With this knowledge of functional changes, we applied Diffusion Tensor Imaging (DTI) and tractography to study structural connectivity of this network.

Methods: Participant youths diagnosed with ADHD were recruited through the Province of Ontario Neurodevelopmental Disorders Network (POND) and the Hospital for Sick Children. Controls were recruited by advertisement. An F-MRI activation map from a previous related experiment was co-registered with each participant’s DTI. This map represented specific brain regions where ADHD youth had significantly diverged from controls during performance of the SST. Probabilistic tractography was performed from these regions to explore connectivity and white matter integrity including fractional anisotropy (FA) and radial diffusivity (RD).

Results: ADHD subjects (N=49) showed structural integrity differences compared to controls (N=16) within tracts between right inferior frontal gyrus (IFG) and right superior temporal gyrus (P=0.01), right IFG and right posterior cingulate (P= 0.042), left middle temporal gyrus (BA 39) and left caudate (P=0.023), and between left middle temporal gyrus (BA 39) and left posterior cingulate (P=0.048). An association was found between degree of inhibitory control deficit and white matter changes between right IFG and caudate (i.e. fronto-striatal pathway, R=-0.27, P=0.048).

Conclusions: Specific white matter tracts related to inhibitory control represent a potential candidate endophenotypic biomarker incorporating brain structure, function and behaviour for future studies of ADHD.
Purpose: Previous research suggest a possible association between autoimmune diseases and schizophrenia; however, this has not been studied in patients with 22q11.2 deletion syndrome (22q11.2DS), a condition where ~25% of affected individuals will develop schizophrenia and where higher rates of autoimmune disease are often observed. We aim to explore the connection between autoimmune disease and schizophrenia in this high-risk genetic population.

Methods: We reviewed lifetime medical records of a cohort of 271 adults with 22q11.2DS (median age: 33 years, range: 18 to 68 years; 143 (53%) females) to investigate the relation between autoimmune disease and schizophrenia. Analyses included odds ratios (ORs) and 95% confidence intervals (CIs) for schizophrenia, for those with and without autoimmune diseases.

Results: Of the 271 patients, 94 (35%; n = 53 females) had a documented autoimmune disease, and 97 (36%; n = 47 females) a diagnosis of schizophrenia. Of those with schizophrenia, 45 (46%) had a comorbid autoimmune disease (e.g., hypothyroidism, hyperthyroidism, psoriasis, immune thrombocytopenia purpura, or vitiligo). Patients with 22q11.2DS and an autoimmune disease were significantly more likely to have a diagnosis of schizophrenia (OR = 2.21, CI 1.32 to 3.71, p = 0.003) than those without an autoimmune disease. This result remained significant after adjusting for age and sex (OR = 1.92, CI 0.11 to 1.19, p = 0.02).

Conclusions: Autoimmune diseases and schizophrenia show significant comorbidity in adults with 22q11.2DS. The 22q11.2 deletion may represent a shared genetic risk factor that could help elucidate the mechanisms underlying susceptibility to both conditions.
Purpose: HIV-related stigma is associated with increased risk for alcohol problems, and maladaptive coping strategies may play a role in this link. However, the temporal relationships among these factors in people living with HIV (PLWH) remain unclear. This study examined prospective bidirectional and meditational pathways between HIV stigma, maladaptive coping, and alcohol use severity in a diverse sample of PLWH.

Methods: Patients receiving care for HIV (N = 1520) who were enrolled in the Ontario HIV Treatment Network Cohort Study (OCS) completed annual assessments of HIV stigma and maladaptive coping, as well as the Alcohol Use Disorders Identification Test (AUDIT) assessing alcohol use severity. Data were analyzed in a four-year cross-lagged panel model.

Results: Greater HIV-related stigma at each wave consistently predicted increased maladaptive coping one year later (βs > .11, ps < .01). Similarly, maladaptive coping consistently predicted greater subsequent HIV-related stigma (βs > .05, ps < .05). Further, we observed some evidence that maladaptive coping mediated the prospective associations between HIV-related stigma and alcohol use severity in both directions (i.e., stigma to subsequent alcohol use severity and vice versa), although these associations were not statistically significant across all waves.

Conclusions/Implications: Findings suggest that HIV-related stigma and maladaptive coping are bidirectionally associated with one another over time. Further, coping may be a mediator of the prospective link between HIV-related stigma and alcohol outcomes, although findings were less consistent for these pathways. Future research should examine whether interventions addressing stigma and coping among PLWH may help to minimize hazardous drinking.
Purpose: The endocannabinoid (eCB) system modulates brain responses to factors related to psychosis risk and relapse including cannabis and stress. In vivo imaging of the eCB system in psychosis has been limited to cannabinoid CB1 receptors. We investigated the eCB system in antipsychotic-naïve first episode psychosis (FEP) patients while controlling for FAAH genetic variation and cannabis use, using PET imaging with C-11 CURB, a ligand for fatty acid amide hydrolase (FAAH).

Methods: In this pilot study, we recruited antipsychotic-naïve FEP and demographically-matched healthy volunteers (HV) participants. Diagnosis of FEP and active symptoms were confirmed by a by clinical interview. HV had no current or past DSM IV axis I diagnosis and no family history of psychotic disorders. The FAAH genetic polymorphism rs324420 affects FAAH protein levels, thus rs324420 genotype was obtained for each subject.

Results: FEP had lower C-11 CURB binding than HV in the amygdala and striatum, with trends toward lower binding other regions including prefrontal cortex. FAAH genotype influenced C-11 CURB binding in FEP and HV, with lower binding observed in A-allele carriers.

Conclusions: Data from this pilot sample provide the first in vivo evidence that FAAH is altered in psychosis, and this change is present near the time of disease onset. Overall, these data provide a tentative link between psychosis and the eCB system, which regulates brain responses to stress and cannabis, two factors implicated in psychosis risk and relapse.
### Abstract Title
Elevated Risk of Leaving Hospital Against Medical Advice for Substance Users Admitted to a Canadian Hospital

### Co-Authors
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### Co-Presenter
Tim Guimond, University of Toronto

### Full Abstract
Purpose: To describe if people who use drugs (PWUDs) presenting to the emergency department and admitted to a large inner-city hospital in Canada are more likely to leave hospital against medical advice (AMA).

Methods: Relative risk calculations for leaving hospital AMA were estimated, using data obtained from hospital administrative data that was used for national reporting from April 2015 to March 2016. Data from all visits to the emergency department (ED) and all admissions to inpatient wards were categorized based on substance use indicators abstracted from triage and physician notes.

Results: A total of 73,722 patients presented to St. Michael's Hospital with 4,157 (5.6%) suspected to have an SUD. These individuals had a relative risk (RR) of 1.32 (confidence interval [CI] 1.15 to 1.50) of leaving the emergency department (ED) before being seen and an RR of 2.41 (CI 1.94 to 2.99) of leaving AMA from the ED. Once admitted, PWUD had an RR of 9.85 (CI 7.48 to 12.97) to leave hospital AMA. The RR of leaving varied widely by department: medical units (RR 8.11 [CI 5.80 to 11.35], psychiatric units (RR 2.16 [CI 0.73 to 6.42]), and surgical units (RR 7.20 [CI 3.17 to 16.34]).

Conclusions: PWUD are at a 10 times greater risk of leaving hospital AMA in a large inner-city hospital in Canada’s largest city. Leaving AMA from the ED or hospital places patients at significant risk of increased morbidity and mortality. This represents a public health and policy issue requiring urgent intervention.
Purpose: High levels of openness, a personality trait related to intellectual curiosity, creativity and variety, is linked to better memory in older adults. However, the association between openness and specific types of memory has not been clearly established. As part of a larger neuroimaging study, we explored the association between openness and performance on standard neuropsychological (NP) tests of memory.

Methods: Participants were older adults (N = 40, 30 females and 10 males, mean age 72, SD = 6.6) with normal performance on a comprehensive NP battery. Memory measures included immediate and delayed recall on the California Verbal Learning Test, the Wechsler Memory Scale Logical Memory (WMS-LM), and the Brief Visuospatial Memory Test (BVMT). Openness was assessed using the NEO Five Factor Inventory. Pearson’s correlation was used to evaluate associations between openness and memory performance.

Results: A significant positive correlation was obtained between openness scores (M = 32.50, SD = 5.97) and immediate recall on the CVLT (Trials 1-5 mean score = 56.58, SD = 10.11, r = .34, p = .03, uncorrected). Openness did not correlate with any other memory measure.

Conclusions: These preliminary findings indicate an association between openness and immediate verbal recall, but not delayed recall, logical, or visuospatial memory. Limitations include the relatively small sample size. However, these results suggest that assessment of personality traits such as openness could serve as potential behavioural indicators of cognitive changes. Our next step involves assessing the relationship between openness and structural neuroimaging biomarkers of Alzheimer’s disease.
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Purpose: This study aims to understand therapeutic relationships within a recovery-oriented forensic setting, and begins to fill the gap on forensic mental health frontline workers’ perceptions and experiences with therapeutic relationships.

Methods: This study is part of a larger evaluation study conducted at an inpatient forensic program. Nurses and allied health staff participated in 87 in-depth interviews throughout the implementation of the Safewards model. The model aims to reduce violence and the use of seclusion and restraints in mental health settings and promotes improved relationships between staff and patients. Interviews were transcribed, reviewed, and analyzed using a qualitative content and thematic analysis approach.

Results: From analyzing the data, main themes and subthemes emerged. A number of characteristics were deemed as important for building relationships. Staff believed it was unfair to stigmatize patients based on their criminal index offence and/or mental illness. When discussing interactions with patients, staff explained they need to overcome personal preconceptions by being more open and non-judgmental.

Conclusion/Implications: In forensic settings, lengthy hospitalization is not unusual. Clinical units may therefore be viewed as “home” by patients, with unit staff being their primary source of support. When a staff and patient possess certain characteristics, they are better able to bond and build relationships, both of which can mitigate violence. Staff’s experiences illustrate that having a good relationship with patients allows a personalized approach for each patient’s care. The findings of this study can be used to develop intervention strategies to enhance relationship building and the recovery process.
Purpose: Antipsychotics (AP), the cornerstone of treatment for schizophrenia, contribute to about 20 years of life lost due to cardiovascular disease. However, mechanisms by which APs cause metabolic dysregulation are poorly understood. The brain has an important role in energy and glucose balance; insulin receptors in the brain are key in regulating glucose production, and also improving cognition. We will investigate if the AP olanzapine (OLA), when given acutely to young healthy volunteers, will impede the glucoregulatory and cognitive benefits of intranasal insulin.

Methods: In a double blind, cross-over design, healthy volunteers (ages 17-35), will be randomized to receive 4 treatment combinations, 4-5 weeks apart, in random sequence: 1) Intranasal placebo (INP) + oral placebo (PL); 2) INP + OLA; 3) intranasal insulin (INI)+ PL; 4) INI+ OLA. Glucose metabolism will be assessed using gold-standard pancreatic euglycemic clamps. Standardized neurocognitive tests will be used to assess verbal fluency and visuospatial memory, which are impaired in schizophrenia.

Results: REB approval for CAMH has been obtained, and we are in the process of applying to Health Canada for approval.

Implications: This proof-of-concept study will identify metabolically adverse mechanisms of AP administration that are related to both lifelong burden and early treatment discontinuation. Further, it will provide the basis for future research designed to mitigate early AP-induced metabolic dysfunction, with ancillary predicted benefits for cognitive functioning. In summary, this work has the potential to initiate new streams of research in an area of unmet need that intercepts disciplines of physiology, endocrinology, and psychiatry.
Purpose; The positive domain and objective side effects of antipsychotic response are usually observed, leaving patients’ subjective experience to antipsychotics neglected. This meta-analysis examines rating scales measuring sub-domains of the subjective impact of antipsychotic treatment in patients with schizophrenia to create a comprehensive scale that measures the subjective domain.

Methods; A systematic search was conducted using MEDLINE, PsycINFO, Embase, and Web of Science. Studies in English meeting the following criteria were included: (1) investigating patients with non-affective schizophrenia spectrum disorder; (2) measuring subjective response to antipsychotic treatment. Scales assessing the subjective domain were ranked by their frequency of use and number of citations. The sub-domains of the higher ranked scales were identified and further analyzed.

Results; Total of 1,130 unique citations were identified and over 100 validated scales measuring the subjective domain were found. The scale analysis revealed the most critical sub-domains investigated in the subjective realm of antipsychotic response in schizophrenia. Identified sub-domains include subjective positive, negative, and cognitive symptoms, well-being, and quality of life. The final analysis of the scales will be discussed.

Conclusions/Implications; The importance of measuring antipsychotic response goes beyond the obvious positive domain and objective side effects. The impact of the subjective domain is critical to measure patients’ well-being and quality of life and may be more correlated to medication adherence and recovery. Moreover, measuring the impact of antipsychotics on the subjective domain might shed light on the differences between the mechanism of action of antipsychotic compounds, addressing the double edge sword of dopamine antagonism.
Examinating an Event-Related Brain Potential Index of Semantic Priming in Cannabis-using Individuals at Clinical High-Risk for Psychosis

Objective: Clinical high-risk individuals (CHR) experience subthreshold schizophrenia symptoms, and are at elevated risk for developing schizophrenia. Cannabis use is also associated with increased schizophrenia risk in the general population, and worse symptoms in schizophrenia and CHR. To better understand interactions between CHR state and cannabis use at the neurocognitive level, we used the N400 event-related brain potential (ERP) to probe semantic processing. N400 is elicited by meaningful stimuli, and is smaller when the stimulus is more related to preceding ones. This “N400 semantic priming effect” has been found to be diminished in schizophrenia. We hypothesized N400 semantic priming effects would be smaller than normal in non-cannabis-using CHR; and even smaller in cannabis-using CHR, paralleling deficits in schizophrenia.

Methods: We recorded ERPs in 10 CHR with past or present cannabis dependence (CHR/C+), 10 CHR without history of cannabis use (CHR/c-), and 11 healthy controls without history of cannabis use (HCs). Participants viewed prime words followed by targets (words related or unrelated to prime, or nonwords) at 300- or 750-ms stimulus-onset asynchrony (SOA). Participants’ task was to indicate via button-press whether the target was a word.

Results: Across SOAs, differences in N400 amplitude to unrelated and related targets were smaller in CHR/C- versus HCs (p < 0.05), but did not differ between CHR/C+ and HC, or CHR/C- and CHR/C+.

Implications: As hypothesized, non-cannabis-using CHR exhibited semantic priming deficits. Contrary to our hypotheses, however, such deficits were not seen in cannabis-using CHR, raising the possibility of a self-medicating effect of cannabis on cognition in CHR.
## Abstract Title

A systematic review of emergency department interventions to prevent suicide in youth

## Co-Authors

Daphne Korczak, MD, MSc, FRCPC (peds), FRCPC (psych), The Hospital for Sick Children; Peter Szatmari, MD, MSc, FRCPC, The Hospital for Sick Children & Centre for Addiction and Mental Health

## Full Abstract

**Purpose:** Suicide is the second leading cause of death amongst adolescents in Canada. A systematic review by Bennett et al (2015) found that few public health interventions altered the rates of death by suicide in this population, however, Emergency Department (ED) transition programs showed promise in decreasing the rate of suicide-related deaths. The goal of this study is to further ascertain the effectiveness of ED interventions targeted at suicide prevention in youth by referring to the primary studies.

**Methods:** A systematic review of RCTs examining suicide prevention interventions in the ED in youth following the PRISMA protocol was conducted. Databases examined included Medline, Embase, PsycINFO, CENTRAL, and CINHAL. Search terms included those related to suicide, deliberate self-harm, and parasuicide, and various terms to capture ED interventions. Where applicable, validated filters for identifying RCTs were applied, and search terms to capture study populations of those ages 25 and under. Conference abstracts, clinical registries, and manual search of reference lists was also conducted. Articles were screened by two reviewers and discrepancies were resolved via consensus.

**Results:** This search yielded 2,007 unique publications, of which 1,958 were excluded on title and abstract screening. A further 36 were excluded after full text review, leaving 13 RCTs for final analysis. Of the 13 studies, 4 provide statistically significant results.

**Conclusions:** There exists a small body of RCTs examining ED-based suicide prevention interventions in youth. The review highlights a need for further clinical trials in this area.
**Purpose:** Previous literature on suicide attempt (SA) has been limited by sample heterogeneity. Here, we examined the clinical characteristics of a homogeneous sample of suicide attempters and non-ideators with schizophrenia. We hypothesized that non-ideators and attempters would display differences in demographic and clinical characteristics.

**Methods:** We recruited 650 participants from the schizophrenia program at the Centre for Addiction and Mental Health. We refined this sample to a SA group (n = 6) with extreme phenotype, consisting of patients who reported having attempted suicide multiple times, with high intent and medical lethality, and by violent means, and further had a family history of SA. The non-ideator group (n = 28) consisted of patients reporting no history of suicidal ideation or attempt, and who further had no family history of SA. Suicide was assessed using The Columbia Scale for Suicide Severity and Beck Scale for Suicidal Ideation.

**Results** Non-ideators and attempters displayed significant differences in sex and age, with attempters being 67% female with a mean age of 52, and non-ideators being 25% female with a mean age of 43. No significant differences were found in current clozapine use, psychotic or negative symptoms, or lifetime alcohol abuse/dependence between groups, but attempters displayed a trend of greater drug abuse/dependence than non-ideators.

**Conclusions/Implications** We conclude that extreme phenotype attempters and non-ideators with schizophrenia differ in demographic but not clinical characteristics. The results point to increased age and female sex, but not increased schizophrenia symptoms or drug abuse/dependence as risk factors for high-lethality SA.
Purpose: Current falls risk assessment tools have limitations in advanced dementia: while they accurately assign virtually all individuals as high risk for falls, they are not specific enough to identify those at the highest risk and require closer monitoring. The Fall Related Impulsive Behaviour Scale (FIBS) helps to incorporate the common dementia symptom of impulsivity into the fall risk assessment. The purpose of this study is to evaluate the sensitivity and specificity of a modified FIBS tool (mFIBS) for fall risk in patients with advanced dementia.

Methods: We are completing a retrospective chart review of 100 patients admitted to a tertiary dementia behavioural care unit. We are recording their STRATIFY scores, mFIBS scores, a description of any falls events and other falls risk factors.

Results: Our preliminary analysis of the first 35 patients has identified 14 “Fallers” (40%) and 21 “Non-Fallers” (60%). The average STRATIFY score for “Fallers” was found to be 3.4 ±1.1 and 2.3 ±1.0 for “Non-Fallers”. The average mFIBS score was found to be 2.1 ±1.3 for “Fallers” and 1.2 ±1.3 for “Non-Fallers”. Following analysis of the remaining 65 patients, next steps will be to develop a Receiver Operator Curve and calculate the sensitivity and specificity for the STRATIFY and mFIBS tools, alone and in combination, in this patient population.

Conclusions: This study aims to evaluate the sensitivity and specificity of the mFIBS tool for fall risk in patients with advanced dementia, to determine if it can improve upon or add to existing falls risk assessments in this population.
Purpose: Chronic dizziness (CD) is defined as a sense of chronic disorientation and unsteadiness due to multiple aetiologies. CD demonstrates a strong psychiatric and psychological link, thus a multidisciplinary approach with psychopharmacological intervention is recommended. Intriguingly, the recovery of individuals with CD that pursue long-term disability (LTD) or a legal claim (LC) to this approach appears hampered. The goal was to characterize the connection between LTD/LC and halted progress in CD recovery, and to explore why LTD/LC are deleterious for psychosomatic illnesses like CD.

Methods: 120 adult outpatients with dizziness-related diagnoses from the Multidisciplinary Neurology Clinic at the Toronto General Hospital, were extracted for a retrospective chart review. Patients with baseline Dizziness Catastrophizing Scale (DCS) and Dizziness Handicap Inventory (DHI) assessments between August 2012 and December 2016 and a follow-up visit within approximately one year were included in the study. The study participants were categorized into two groups: ‘On LTD/LC’ (n = 48) or ‘No LTD/LC’ (n = 52).

Results: There was a difference in the mean percentage changes in DCS (t (104) = 2.31, P = 0.023) and DHI (t (109.46) = 2.15, P = 0.034) scores between patients on LTD/LC and patients not on LTD/LC.

Conclusions: The recovery of CD patients on LTD/LC appear hampered when compared to the no LTD/LC cohort. This finding is likely rooted in the destructive degree of anxiety the LTD/LC process can instil in patients and the deleterious effects of assuming a sick-role while afflicted with a psychosomatic illness.
Purpose: The undergraduate medical curriculum in Psychiatry at the University of Toronto involves a course for medical clerks on interview skills. To standardize the quality of training being delivered at different teaching sites, a course manual was created. However, despite such a manual, there was significant variability in the way the course was being taught between sites. Therefore, an attempt was made to revise this manual to accommodate the varying resources available at each site while also maintaining a degree of standardization. The purpose of this study was to qualitatively assess the process of revising the instruction manual for the psychiatry interview skills course.

Methods: Anonymous feedback surveys were sent to the developers of the revised manual and to the course instructors.

Results: Developers identified multiple barriers in finding a systematic approach to revising this manual: themes such as logistical difficulties, varied viewpoints on course purpose and the tension between flexibility and standardization were elucidated. Instructors felt the revised manual was more useful and appropriate compared to the original. Feedback also included a suggestion for future iterations of the manual, including increased content clarity and consideration of separate manuals for instructors and learners.

Conclusion: Obstacles in the review process may have been decreased if additional feedback was obtained from key players prior to starting the revision process. The new manual has been well received but continues to have room for improvement.
Effects of Simple Breathing Manoeuvres on Heart Rate Variability in Healthy Individuals

Argie Gingoyon, Rotman Research Institute, Baycrest Health Sciences; Dr. Linda Mah, Rotman Research Institute, Baycrest Health Sciences, University of Toronto, Department of Psychiatry, Geriatric Psychiatry Division

Purpose: Heart rate variability (HRV), defined as the change in time interval between adjacent heartbeats, is decreased in patients with psychiatric conditions, and is associated with greater risk of morbidity and mortality [1, 2]. In particular, a vagally-mediated component of HR, identified as high-frequency HRV (hf - HRV), is linked to better emotional stability. HRV can be altered acutely through orthostatic manoeuvres and changes in breathing rate and pattern [3, 4, 5]. In this pilot study, we examined the effect of systematically manipulating the ratio of inspiration to expiration (I/E ratio) on HRV in healthy individuals. We predicted that longer expiration would acutely increase hf - HRV.

Methods: Six healthy females aged 20 - 36 years completed a task which required them to vary the length of inspiration and expiration of breathing under three conditions: 1) Equal inspiration and expiration duration (I/E ratio = 1.0), 2) Longer expiration (I/E ratio = 0.5), 3) Longer inspiration (I/E = 2.0). HRV was measured using both electrocardiogram (EKG) and plethysmograph (Pulse) using Biopac. HRV time- and frequency domain parameters were extracted and analyzed using repeated measures ANOVA with I/E condition as the within-factor.

Results: As hypothesized, greater hf-HRV was observed in condition 2 (longer expiration; M = 3.18 SD = 1.25, p = .04) compared to condition 3 (longer inspiration) based on EKG measurement of HRV. No differences in any HRV parameter were detected relative to condition 1 (equal I/E).

Conclusions: These pilot data support the feasibility of altering HRV through systematic manipulation of the duration of inspiration and expiration phases of breathing.

### Full Abstract

**Purpose:** The Depression Early Warning (DEW) Study aims to track relapse of depression in youth by examining changes in physical activity, sleep activity, and self-reported mood and behaviour across the depressive episode.

**Methods:** Youth will use a GENEActiv Original wrist-worn accelerometer to monitor daily physical and sleep activity. Using their personal smartphones, youth will also complete an Ecological Momentary Assessment (EMA) – a short survey that samples participants’ current mood, behaviours, and experiences in real time. Youth will provide two to four weeks of accelerometer data and one week of EMA data every three to four months. This will allow us to examine this data across depressive episodes, responses to treatment, relapse and remission.

**Conclusions / Implications:** The investigators hypothesize that variation in one or more of these measures predicts clinical deterioration and relapse. Therefore, data from these biopsychosocial markers will prove useful in anticipating an upcoming episode before it is fully manifest, and the predicting variables associated with the event may play a significant role in illness. This pilot study and its results will consider feasibility and effectiveness of design, assess the predictive power of explanatory variables, and gather preliminary information that will build a first core of data for a larger study.
Background: Patient response to antidepressant varies greatly, likely contributed by multiple factors, including mutations, altered signaling and metabolic pathways. This project aimed to integrate DNA, microRNA and mRNA data to discover molecular pathways associated with treatment response to antidepressants using an integrated network analysis approach.

Methods: Biological samples were obtained from three antidepressant clinical trials (11918A, 11984A, 13267A). The cohort included patients treated with duloxetine, and data comprised DNA samples from 186 subjects, microRNA and mRNA samples from 124 subjects. The molecular data was integrated using mirDIP, IID and pathDIP, annotated resources for microRNA:gene predictions, protein:protein physical interactions, and comprehensive pathway enrichment analysis (http://ophid.utoronto.ca/mirDIP, .../iid, .../pathDIP).

Results: Analysis of individual data sources yielded no significant results; however, network-based analysis across microRNA, RNA and DNA samples identified 1,142 significantly enriched pathways. Immune signaling pathways emerged as the most significant pathways both individually and upon systematic domain specific classification. The top immune signaling pathways were then successfully validated for differential expression among predicted responders to duloxetine.

Conclusions: The results confirmed currently implicated pathways and pointed towards novel pathways for further exploration. In particular, specific pathways such as TRAF6 emerged as key players in antidepressant treatment response to duloxetine. Within the validated immune signaling pathways could exist proteins that serve as unique molecular targets to decipher the biology of antidepressant treatment response. The integrative network analysis approach demonstrates that variations of a small effect size at the molecular level can aggregate within pathways that could be meaningfully explored and targeted in antidepressant response.
Purpose: Family Navigation services within the mental health and addictions service system have received increasing interest over the past decade. However, little is understood about the added value of peer support for caregivers within a Navigation service model. The Family Navigation Project (FNP) developed the role of Parent Advocate with Lived experience (PAL) to provide caregiver peer support to complement Navigation for families of youth with mental health and/or addiction concerns.

Methods: Caregivers who accessed Navigation and peer support, and caregivers who solely accessed Navigation were asked to rate their perceptions of their own caregiver experience pre-(retrospectively) and post-contact with FNP.

Results: There was high satisfaction with the caregiver peer support available through the PAL role. A repeated-measures MANOVA demonstrated that there was a significant main effect of time, (F(15, 8) = 5.82, p = .008, partial eta2 = .916), and a significant time (pre vs. post) and group (PAL + Navigator vs. Navigator alone) interaction, (F(15, 8) = 3.69, p = .034, partial eta2 = .874), such that participants had more positive perceptions and beliefs about their caregiving experience after having accessed the PAL services, compared to participants who had not accessed the PAL services.

Conclusions: The findings that demonstrate the positive addition of caregiver peer support within the Navigation model can support future development of peer support roles within other family-based mental health and/or addiction programs and services.
Purpose: Prefrontal cortical function compensates for cognitive deficits in patients with Mild Cognitive Impairment (MCI). Prefrontal theta-gamma coupling (TGC) is a neurophysiologic measure associated with ordering of information during the N-back, a working memory task, including in patients with MCI. The aim of this study is to extend the validity of TGC in ordering of information using a different working memory test and other cognitive tests that require ordering.

Methods: 75 patients diagnosed with MCI (mean age = 71.46, SD = 6.37) were assessed using a neuropsychological battery that includes three tests that require ordering: a working memory test (Paced Auditory Serial Addition Test; PASAT); a verbal memory test (California Verbal Learning Tests-II; CVLT-II semantic clustering); and an executive function test (Trail Making B Test; TMT-B). TGC was measured using electroencephalography during the 2-back condition of the N-back task.

Results: There were significant associations between TGC and PASAT ($\beta = 2.91, p = .02$) and TMT-B ($\beta = .06, p = .02$) but not with CVLT-II clustering score ($\beta = .25, p = .67$). Further, there were no associations between TGC and cognitive tests that do not require ordering.

Conclusions/Implications: Our findings validate the use of prefrontal TGC as a marker of ordering of information in executive function and working memory. The lack of association during the verbal memory test is likely due to our MCI participants not using clustering as a recall strategy during the CVLT-II. Semantic clustering relies heavily on semantic processing, which is impaired in prodromal Alzheimer’s Disease (i.e., MCI). These results provide further support to the use of TGC as an index of prefrontal cortical function in patients with MCI.
Purpose: Vascular disease is an important contributor to neurocognitive disorders including Alzheimer’s disease (AD). White matter hyperintensities (WMH) on magnetic resonance imaging (MRI) reflect cerebrovascular disease and are associated with an increased risk of stroke, dementia and death. (BMJ 2010;341:c3666). Positron emission tomography (PET) can quantify amyloid burden, a marker of AD-related neuropathology, using Pittsburgh Compound B (PIB). PIB PET may also be used to estimate cerebral blood flow (CBF). We investigated whether PIB PET also contains information associated with WMH.

Methods: We analyzed data from an ongoing trial PACT-MD, including the participants who had completed PIB PET, T1 and T2 FLAIR MRI: 34 individuals aged 60-90 with either mild cognitive impairment, depression or both. We calculated standard measures of PIB, and also used the time activity curve (TAC) to calculating the slope of radiotracer uptake from the first frame to the maximum in grey matter and white matter. WMH were estimated from T1 and T2 FLAIR MRI using 3 automated algorithms, and absence of WMH was determined by consensus using cut-offs established by inspecting the histograms from each algorithm.

Results: Six of 34 individuals were found by consensus to have minimal WMH. Those without WMH had a faster initial tracer uptake in their white matter, (t = 2.38, df = 7.12 p = 0.048), but not in their cortex.

Conclusions/Implications: In addition to amyloid burden and CBF, PIB PET may reflect WMH burden, and therefore provide useful information in PIB PET studies. Further investigation and replication is warranted.
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<tr>
<td>Co-Authors</td>
<td>Dr Z Bhutta, Centre for Global Child Health, SickKids; Dr P Szatmari, SickKids, Centre for Addiction and Mental Health,</td>
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Purpose: Pakistan has one of the world’s largest populations of young people (10 - 19 years) at approximately 40 million. These adolescents face unprecedented challenges in relation to stunting and mental health. Data on the global burden of stunting after five years of age are limited, but estimates from some countries suggest that up to fifty percent of all adolescents are stunted. Additionally, many low- and middle-income countries, lack of robust mental health care delivery systems. The Nash-wo-Numa Study aims to determine the prevalence and severity of (a) linear growth faltering and (b) depression among girls between 9 - 14.9 years of age and boys 10 - 15.9 years of age living in Matiari. Additionally, the study aims to identify factors associated with linear growth faltering and depression during the childhood to adulthood transition in rural Pakistan.

Methods: This cross-sectional study will include 1,425 children between 9.0 - 15.9 years of age who live in the rural District of Matiari, Pakistan. Participants will be assessed for anthropometric measures, puberty phase, nutritional biomarkers as well as depression, anxiety and trauma using validated scales. A maternal component assessing household variables, participant mental health and maternal mental health is also included.

Results: Study implementation set for summer 2018

Conclusions/Implications: The proposed study aims to complete the picture of adolescent linear growth and depression with puberty indicators. This information may improve future adolescent intervention strategies regarding linear growth and mental health during the childhood to adulthood transition in rural Pakistan.
Purpose: Family Navigation has recently gained recognition as a care model that supports youth with mental health and addiction (MHA) issues and their families in connecting with needed services. Identifying the core components of Navigation is important to guide service delivery.

Methods: The Delphi method was used to attain consensus among three panels of 41 experts (Family Navigation Project (FNP) team members, MHA service providers within the GTA, and current and former clients of the FNP). The FNP is a family-centered navigation program in Ontario that helps families of youth ages 13-26 with MHA concerns to find appropriate services. Through three rounds of ratings, the panel generated and prioritized key indicators of: a successful Navigation process, the features of a good match between youth/families and services, and outcomes of importance in Family Navigation. Items rated as very or extremely important by 80% or more of the participants had achieved consensus, which was confirmed using intraclass correlations (ICC).

Results: Sample items with 100% consensus are: navigator determines the best fit by considering the youth and families’ needs, collaborating with team members and service providers, and providing individualized suggestions; referred service providers are knowledgeable and up-to-date on evidence-based practice and have multidisciplinary perspectives in service. The ICC for all items is .84.

Conclusions/Implications: Identifying priorities and defining success for Family Navigation services is essential for creating a unified understanding of this innovative model of care delivery that addresses families’ unique needs and informing the development of effective Navigation services within the MHA system.
### Chapman, Linda

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<th><strong>Department</strong></th>
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<td><strong>Abstract Type</strong></td>
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<td><strong>Abstract Title</strong></td>
<td>Art Therapy in Recovery from OCD: Preliminary Findings from an Intensive Treatment Program</td>
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<tr>
<td><strong>Co-Authors</strong></td>
<td>Peggy Richter, Sunnybrook Health Sciences Centre; Marlene Taube-Schiff, Frederick W. Thompson Anxiety Disorders Centre</td>
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#### Full Abstract

**Purpose:** Individuals with symptoms of severe, treatment refractory Obsessive Compulsive Disorder (OCD) often fail to respond to implementation of gold-standard treatments. Therefore, understanding feasibility of other interventions is necessary. Art Therapy has been used and shown promise in a wide range of mental health disorders and settings since the 1940’s (Malchiodi and others), but has not been systematically evaluated in OCD. The goal of this project is to determine the usefulness of Art Therapy for individuals with severe and refractory OCD receiving treatment in a specialized intensive program.

**Methods:** Group Art Therapy was offered on a weekly basis as part of the Intensive Treatment Program for OCD at the Thompson Centre in Toronto, Sunnybrook Health Sciences Centre. The group model is semi-structured, with 1-3 weekly “prompts” (suggestions for a theme) for art-making posted on a whiteboard. Following art time, each person may discuss their art in a reflective discussion with the group. A short survey was distributed to participants at the end of sessions to further encourage reflection on the meaningfulness of their experience.

**Results:** Twenty-one individuals diagnosed with severe OCD have attended the group since July 2017. Preliminary survey results reveal a high degree of satisfaction with the group: patients describe Art Therapy as helpful in terms of self-expression, self-reflection, and increasing feelings of calmness. Further qualitative outcomes will be presented in greater detail.

**Conclusions/Implications:** Preliminary results from this ongoing survey point to the usefulness of Art Therapy as experienced by individuals with OCD in an intensive treatment program.
Full Abstract

Purpose: To assess two diverse specialties’ (psychiatrists and general surgeons) current engagement with performance data to inform lifelong learning (LLL) and to explore how this engagement level is influenced by individual and organizational factors, such as motivation to learn, their professional environment and access to data.

Methods: A practice-focused survey was administered through the Canadian Psychiatric Association (CPA) and Canadian Association of General Surgeons (CAGS) member email listserves and at their annual conferences in September 2017. This survey asks for physicians’ practice context, orientation to LLL using JeffSPPL and data use in practice and for learning. Descriptive statistics were used to analyze preliminary survey data.

Results: 238 practicing physicians (203 CPA; 35 CAGS members) participated in this study over a 6-month period (September 2017 – March 2018). The average JeffSPPL scores were 47 for CPA and 44 for CAGS members, representing positive indication towards LLL. The majority were high data users for learning (CPA: N=115; 61.2%; CAGS: N=19; 55.9%) with differing motivation level to use clinical data for performance improvement (CPA: somewhat motivated, N=62; 35.8%; CAGS: highly motivated, N=19; 55.9%). Both specialties strongly felt that organizational policies make it difficult to access (CPA: N=109; 61.9%; CAGS: N=21; 61.8%) and use/interpret (CPA: N=95; 54.6%; CAGS: N=21; 61.8%) clinical data for learning.

Conclusions/Implications: We will develop a framework reflective of the reported influences of clinical data use for performance improvement to support data adoption for LLL. of Art Therapy as experienced by individuals with OCD in an intensive treatment program.
Abstract Title: The Role of the Dopamine D3 Receptor in Alcohol Use Disorder

Co-Authors: Saima Malik, Centre for Addiction and Mental Health; Christina N. Nona, Centre for Addiction and Mental Health; Esmaeil Mansouri, Centre for Addiction and Mental Health; Christian Hendershot, Centre for Addiction and Mental Health, University of Toronto; Isabelle Boileau, Centre for Addiction and Mental Health, University of Toronto; Bernard le Foll, Centre for Addiction and Mental Health, University of Toronto

Full Abstract: Background: While animal models have implicated the dopamine D3 receptor (D3R) in alcohol use, AUD research in humans provides limited understanding with respect to the specific role of D3R in AUD. This project aims to extend on preclinical research by investigating D3R in human AUD subjects.

Purpose: (1) to examine the regulation of D3R levels in AUD subjects (compared to previously acquired controls); and (2) to explore how craving and motivation to consume alcohol relate to D3R levels. We hypothesize an upregulation of D3R in AUD subjects as well as a positive association between D3R levels and our behavioral measures.

Methods: D3R levels in AUD subjects (n = 10) (and healthy controls, n = 18) were estimated using Positron Emission Tomography (PET) along with a D3R preferring radiotracer, [11C]-(+)-PHNO. D3R levels in the AUD group were then correlated with measures of craving (assessed by a cue-exposure paradigm) and motivation to consume alcohol (assessed by a computer-assisted intravenous alcohol self-administration paradigm under a progressive ratio schedule).

Results: Preliminary data show no differences in [11C]-(+)-PHNO binding between AUD subjects and controls. Exploratory analyses in the AUD group revealed no relationship between self-administration peak blood alcohol concentration and [11C]-(+)-PHNO binding. However, there was a positive association between craving score increases and [11C]-(+)-PHNO binding in several brain regions (e.g., globus pallidus, r=0.74, p<0.05; dorsal striatum, r=0.89, p <0.001; ventral striatum, r=0.75, p<0.05) Conclusions: While these data show no differences in D3R binding between AUD subjects and controls, this early data does suggest a role of D2/3R in alcohol craving.
### Department Division
Brain and Therapeutics, Department of Psychology

### Affiliation
Resident Physician

### Setting
Hospital for Sick Children

### Abstract Type
Poster Presentation

### Research Theme
Neuroscience and Mental Health

### Abstract Title
Towards optogenetic control of protein translation

### Co-Authors
Lau, Jacelyn; Rashid, Asim; Josselyn, Sheena

### Full Abstract

Purpose: De novo protein synthesis is thought to underlie the activity-dependent changes in neuronal synapses during memory formation, and translational aberrations have been implicated in numerous neuropsychiatric and neurocutaneous diseases, particularly autism spectrum disorder, schizophrenia spectrum disorders, as well as tubular sclerosis. However, studies on translational control have thus far been largely carried out in genetic knockouts models or through protein synthesis inhibitors, with both techniques suffering from lack of temporal and spatial specificity and/or lack of reversibility.

Methods: To address the aforementioned shortcomings, in this study we developed optogenetic viral constructs for photo-control of eukaryotic translations through modification of translational initiator 4E as well as inhibitor 4E-Binding Protein (4EBP). We aim to validate our constructs through numerous functional testings in primary neuronal cultures as well as human embryonic kidney cell lines prior behavioural experiments in animal models. Implications: We believe that photo-control of molecular translation would aid in future studies on the role of protein synthesis in neuropsychiatric diseases.

Results: In vitro validation of optogenetic viral contracts in yeast revealed rapid and reversible control of protein translation.

Conclusion: Optogenetic approaches could offer novel strategies for examining role of translational control in in vitro and in Vivien settings.
Background: Patients with schizophrenia population have persistent cognitive deficits and frequently exhibit co-morbid cannabis use disorders. Delay discounting is a cognitive measure which assesses impulsivity during current versus future scenarios. Furthermore, cannabis use has been shown to affect decision making and self-control.

Objective: To examine the role of delay discounting in predicting cannabis abstinence in cannabis-dependent schizophrenia and non-psychiatric subjects.

Hypothesis/Purpose: We hypothesized that deficits in delayed discounting at baseline would predict 28-day cannabis abstinence across all groups (schizophrenia and non-psychiatric).

Methods: Schizophrenia patients (n=19) and non-psychiatric controls (n=20) with confirmed DSM-IV cannabis dependence completed the study. Participants completed the Kirby Delayed Discounting Task (KDDT; an index of delayed discounting) at baseline and this was correlated with successful cannabis abstinence in a subsequent 28-day period.

Results: One-way ANOVAs demonstrated no significant differences in KDDT values between diagnostic groups at baseline (p>0.05). The groups were then split into biochemically-verified cannabis abstainers and non-abstainers to examine effects of baseline KDDT scores on subsequent cannabis abstinence. There were no differences in KDDT performance between cannabis abstainers and non-abstainers in both the schizophrenia (p>0.05) and non-psychiatric control (p>0.05).

Conclusion: In this preliminary analysis, KDDT does not appear to predict cannabis abstinence in schizophrenia and non-psychiatric cannabis users.
Title: Does pre-existing Alcohol Use Disorder increase the risk of Posttraumatic Stress Disorder development? Results from a longitudinal nationally representative sample.

Co-Authors: Thaneson Balachandran, University of Toronto; Ahmed Hassan, Centre for Addiction and Mental Health, University of Toronto; Bernard Le Foll, Centre for Addiction and Mental Health, University of Toronto

Co-Presenter: Thaneson Balachandran, University of Toronto

Full Abstract:

Purpose: There is inconsistency in the literature for the causal relationship of Alcohol Dependence (AD) on Post-Traumatic Stress Disorder (PTSD) development. The aims of this study were to a) investigate the risk of trauma exposure among individuals with past-year alcohol dependence (pyAD) in comparison to individuals without AD; b) to evaluate the risk of PTSD development among individuals exposed to trauma.

Methods: Longitudinal data over 2-3 years was obtained from 30,180 individuals with and without pyAD from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) waves I and II. We compared the percentage of exposed traumas that occurred during follow-up between the two groups. Using propensity score methods, we matched individuals with pyAD to those without pyAD (control group) at baseline, on demographics, familial and clinical factors to estimate the risk of development of PTSD after trauma exposure. Data were adjusted for complex survey methods.

Results: Individuals with pyAD had a higher incidence of several traumas between the two waves compared to the control group. Witnessing trauma, exposure to serious accidents and being mugged were among the commonest trauma exposure types. Among individuals exposed to trauma between the two waves (n=22,873), pyAD increased the risk of subsequent PTSD development (OR = 1.78, 95%; CI: 1.25-2.53, p < 0.01) after matching and controlling for covariates.

Conclusion: The results confirm the relationship of the high risk and susceptibility models between AD and PTSD. Routine screening for this comorbidity and psychoeducation about the risks of excess drinking should be routinely provided.
Purpose: Schizophrenia is a major psychiatric disorder characterized by diverse and complex symptoms such as hallucinations, disorganized thoughts and sometimes violence. Violence occurs with greater frequency in schizophrenic patients relative to the general public. This contributes to patient stigmatization, and their struggle to maintain steady work, secure housing, and hinders their overall stability. Oral clozapine has been shown to reduce persistent aggression, while long-acting injectable antipsychotics (LAIs) are suspected to reduce psychosis induced violence by improving compliance and maintaining stable blood antipsychotic (AP) concentrations. However, there are no published trials exploring the efficacy of LAIs focused on reducing chronic violent behaviour. In an effort to address this gap, we seek to understand how a patient’s history of violent behaviour influences their current AP regimen. Specifically, we want to determine if the prescription of LAIs, polypharmacy, and/or increased AP dosage is dependent upon patients’ history of violence.

Methods: Participants were included if they had a diagnosis of schizophrenia or schizoaffective disorder. Patients’ EMRs, located in CAMH’s I-CARE software, were reviewed.

Results: We found that lifetime violence was not a predictor of current LAI treatment, polypharmacy, or high AP doses.

Conclusions: In conclusion, studies with larger samples are needed to determine how the different antipsychotic medication dosage affects the risk for violence.
**Deparment Division**: Adult Psychiatry and Health Systems  
**Affiliation**: Postdoctoral Clinical or Research Fellow  
**Setting**: Hospital for Sick Children  
**Abstract Type**: Poster Presentation  
**Research Theme**: postpartum, relationship satisfaction, father involvement  
**Abstract Title**: The Father Factor: A tale of breastfeeding, parity, childcare, chores, and sex  
**Co-Authors**: Wibke Jonas, Karolinska Institute; Eva Unternaehrer, Konstanz University; Aya Dudin, McMaster University; Peter Szatmari, Centre for Addiction and Mental Health, Hospital for Sick Children; Helene Gaudreau, McGill University; James Kennedy, Centre for Addiction and Mental Health; Leslie Atkinson, Ryerson University; Meir Steiner, McMaster University; Michael Meaney, McGill University; Alison Fleming, University of Toronto Mississauga

**Full Abstract**

**Purpose:** Mothers’ postpartum assessment of her partner relationship and interest in sex often declines, possibly due to violated expectations surrounding childcare. Our objective is to examine the associations in mother’s satisfaction with father involvement with relationship satisfaction and interest in sex, in the contexts of parity and breastfeeding as indicators of increased maternal demands.

**Methods:** Participants (n = 222) completed questionnaires at 4 time points, 3-24 months postpartum, in the MAVAN study, a prospective, multicenter study following mothers and their infants. The main outcomes were mothers’ relationship satisfaction at 6 and 24 months postpartum and interest in sex at 6 months postpartum. We used mediation models and linear regression.

**Results:** Breastfeeding predicted decreased relationship satisfaction, mediated by mothers’ dissatisfaction with father involvement, dependent on parity: multiparous breastfeeding mothers were the most dissatisfied with father involvement (p<0.05). Mothers’ satisfaction with father involvement at 6 months predicted increased relationship satisfaction at 24 months through increased relationship satisfaction at 12 months (95%-CI=-.304 to -.104), but not through father involvement at 18 months (95%-CI=-.100 to .036). Mothers’ satisfaction with fathers’ involvement was a better predictor of interest in sex than overall relationship satisfaction (adjusted R2=0.184, p<0.001).

**Conclusions:** Multiparous breastfeeding mothers are more dissatisfied with the level of father involvement in caretaking than non-breastfeeding mothers and primiparous breastfeeding mothers. Regardless of parity, mothers’ satisfaction with earlier, rather than later, father involvement is a potent predictor of overall relationship satisfaction and interest in sex, indicating a possibility for a “critical period” for satisfaction with father involvement.
**Abstract Title**
Individuals with Autism Spectrum Disorder in the Psychiatric Emergency Department: Unique Needs and Considerations

**Co-Authors**
Yona Lunsky, Centre for Addiction & Mental Health; Amanda Sawyer, Centre for Addiction & Mental Health; Natasha Fernandes, Centre for Addiction & Mental Health

**Purpose:** Previous research has examined the experiences of individuals with Autism Spectrum Disorders (ASD) and individuals with intellectual disabilities (ID) in emergency department (ED) visits; however, no studies have directly compared the ED visits of these two groups. This paper analyzes how the psychiatric ED visits made by older adolescents and adults with ASD differ from the visits of individuals with ID.

**Methods:** Researchers conducted a retrospective chart review of visits to a psychiatric emergency department in Toronto, Ontario between October 27, 2016 and January 4, 2017. Demographics and clinical profiles of ED visitors with ASD (n=27) and ID (n=73) were compared.

**Results:** The ASD group was younger and had a greater proportion of males than the group with ID. There was a trend for those with ASD to be more likely to be living with family. These groups did not differ from one another with regard to ED disposition, or rate of restraint usage. Eighty-four percent of adults with ASD had some type of restraint used and 42.4% were admitted to hospital as a result of their visit, similar to individuals with ID. In 72.7% of visits of those with ASD and 86.1% of visits of those with ID, family caregivers were not consulted.

**Conclusions/Implications:** Adults with ASD differ demographically from adults with ID visiting a psychiatric emergency department, although presentations and outcomes tend to be similar. More effort can be paid toward preparing individuals with ASD for emergencies and supporting them in the ED environment.
Purpose: We aim to analyze the effect of polygenic risk scores on suicide attempt. Owing to the excess suicide-related mortality associated with schizophrenia, and the high genetic susceptibility, we hypothesize that polygenic risk scores will predict lifetime suicide attempt status, with lower scores for individuals without any lifetime attempt of suicide, and higher scores for individuals with a lifetime suicide attempt.

Methods: We recruited 224 Participants from the Centre for Addiction and Mental Health. The psychiatric diagnosis was confirmed using the Structured Clinical Interview for DSM-IV and DSM-5 (SCID). Individuals were assessed for lifetime suicide attempt status using the Columbia-Suicide Severity Rating Scale (C-SSRS). We have used the Childhood Trauma Questionnaire (CTQ) to measure the presence and severity of trauma and neglect before the age of 18. Genotyping was done using Illumina-2.5 Omni SNP array. Therefore, 108 SNPs were selected based on the highest effect sizes at each locus from the initial list of 128 genome-wide significant SNPs found by the Psychiatric Genomics Consortium.

Results: Combining all available markers (n=108) in our pilot data, we have obtained the number of risk alleles for each subject (unweighted PRS) in 136 NSA and 88 SAtt. There were no significant difference in weighted polygenic scores between suicide attempters and non-attempters (p= 0.517).

Conclusions/Implications: Contrary to our hypothesis, polygenic risk scores were not predictive of lifetime suicide attempter status. Further well-powered studies on high lethality attempters versus suicide non-ideators may help determine the utility of polygenic scores in predicting suicide risk in schizophrenia.
### Department Division
Consultation Liaison Psychiatry

### Affiliation
Mid-Career or Senior Faculty (More than 5 years since 1st academic appointment)

### Setting
Hospital for Sick Children

### Abstract Type
Poster Presentation

### Research Theme
Somatic symptoms and related disorders (SSRD), Integrated Care, Clinical Pathway

### Abstract Title
An Integrated Mind-Body Connection Clinic: An Answer for Patients with Somatic Symptoms and Related Disorders

### Co-Authors
Hana Saab, SickKids Psychiatry; Hina Ansari, SickKids Psychiatry

### Co-Presenter
Hana Saab, SickKids Psychiatry;

### Full Abstract
**Purpose:** Somatic symptoms and related disorders (SSRD) patients have high health system utilization and costs. They may be under-recognized, receive inappropriate and costly medical care, and may not receive timely mental health support. We present an implementation evaluation of an Integrated Mind Body Connection (iMBC) Clinic for Paediatric patients to assess the impact of an integrated care model by a Consultation Liaison (CL) Psychiatry clinician and Pediatrician on (a) patient outcomes and (b) healthcare system efficiencies.

**Methods:** The iMBC clinic is innovative in its composition and approach to advancing Paediatric health care. It is premised on interdisciplinary teams using a biopsychosocial approach to conducting joint assessments of patients and family that allows education about the mind-body connection and diagnosis and discussion of treatment plans leading to greater uptake of mental health interventions earlier in the care trajectory.

**Results:** We present an evaluation framework where data will be gathered at multiple timepoints to capture: (a) Functionality; (b) Quality of Life; (c) Discharge dispositions; (d) Emergency visits, medical investigations and admissions compared to pre-implementation of clinic; and (f) Patient/family experience and satisfaction.

**Conclusions/Implications:** This is will be the first study in Canada that examines the role of an integrated Paediatric and CL Psychiatry clinic in improving services and system improvement and health outcomes for patients with SSRD. The study will allow the testing of a clinical pathway and tools that if standardized, could lead to a new approach to triaging SSRD patients and determining appropriate treatment interventions and pathways accordingly.
Purpose: Bipolar disorder (BD) is a complex and heterogeneous illness that is among the most heritable in psychiatry. Genome-wide association studies and individual candidate gene studies have found several genetic polymorphisms associated with BD. Individually, these genes have limited effects, and few studies have examined the collective effects of multiple genes concurrently. We selected 35 genes which have previously been implicated with either BD or associated characteristics, from which to select the most robustly predictive group of genes.

Methods: DNA was extracted from saliva and genotyped for 113 adolescents with BD (29 BD-I, 50 BD-II, 34 BD-NOS) and 146 healthy controls. The 35 candidate genes were entered into backwards and forwards stepwise AIC regression models, searching for the strongest predictors of BD. The 10-fold cross-validation prediction error was used to compare models along with AUC of ROC.

Results: The prediction errors were 22.96% and 23.23% and the AUC of the ROCs were 73.27% (CI: 67.27 - 79.27) and 75.69% (CI: 69.94 - 81.44) for the forwards and backwards models, respectively. The following 3 genes were significant in both models: IL6 (rs1800795; \( \chi^2_{\text{Backward}} = 7.05, p_{\text{Backward}} = 0.029 \); \( \chi^2_{\text{Forward}} = 8.14, p_{\text{Forward}} = 0.017 \)), IL10 (rs1800896; \( \chi^2_{\text{Backward}} = 12.77, p_{\text{Backward}} = 0.005 \); \( \chi^2_{\text{Forward}} = 11.65, p_{\text{Forward}} = 0.009 \)) and SOD2 (rs4880; \( \chi^2_{\text{Backward}} = 12.94, p_{\text{Backward}} = 0.004 \); \( \chi^2_{\text{Forward}} = 12.24, p_{\text{Forward}} = 0.0096 \)). Additionally, the following genes were significant in the backwards model: DISC1 (rs821577), GPX3 (rs3792797), and PER2 (rs2304672).

Conclusions: These preliminary findings implicate genes within inflammatory and oxidative stress pathways in adolescent BD, converging with prior evidence of imbalance in related proteins in adult BD. Future studies including larger samples, genome-wide analysis, and imaging phenotypes are warranted.
Introduction: Patients with schizophrenia consistently sample less information when making a decision than healthy controls. This is commonly referred to as “Jumping to Conclusions” (JTC) and assessed using the “Beads Task.” It is believed that this bias in information sampling is related to the development of delusional ideation in schizophrenia and may be a trait marker of the disease. Moreover, patients with schizophrenia are less likely to solve problems analytically compared to healthy controls, as assessed using the cognitive reflection test (CRT). However, it is unknown whether JTC is related to performance on the CRT. The aim of this paper was to examine whether CRT performance is related to JTC in healthy persons.

Method: Twelve undergraduate students (mean age: 1.83±1.90; 9 females) participated in this study. They completed several tasks, including: the Beads Task, the Cognitive Reflection Test, the Delay Discounting Questionnaire, Letter Number Span, Schizotypal Personality Questionnaire, Paranormal Thinking/Magical Ideation Scales, Wide Range Achievement Test-4 Reading, Rey 15-item Recall and Recognition, Peters et al Delusions Inventory, Launay Slade Hallucinations Scale, Davos Assessment of Cognitive Biases Scales, Karolinska Scales of Personality and a computerized test (BRAINscreen).

Results: Non-analytical thinkers pulled less beads compared to analytical thinkers on the beads task (8.25±3.21 vs. 9.88±3.99; (t(10)=.78, p=.46)). Schizotypal traits were not significantly associated with cognitive thinking style.

Conclusions: Non-analytical thinkers were more likely to jump to conclusions than analytical thinkers. However, due to sample size limitations, our study was significantly underpowered to detect potentially meaningful significant effects. These findings have the potential to inform the mechanisms underlying the formation of delusional ideation in persons with schizophrenia.
Purpose: Neurodevelopmental disorders (NDDs) share many characteristics and frequently co-occur. Irregular functional connectivity (FC) has been associated with individual NDDs but few studies have investigated multiple NDDs together. Additionally, no study has examined different domains of FC across disorders. Here, we examined intrahemispheric, homotopic and heterotopic connections, to determine whether selective connections are impaired across different NDDs.

Methods: Resting-state functional-MRI data from the local Province of Ontario Neurodevelopmental Disorders (POND) study (ASD n=35, OCD n=39, ADHD n=38) was preprocessed to correct for artifacts and subject motion. The Human Connectome Project multi-modal parcellation was used to define subject specific cortical regions of interest (ROI). FC strength and temporal stability were generated for each pair of ROIs. Connections were classified as: intra-hemispheric, homotopic or heterotopic. For each measure, a linear mixed-effects model was used to test the effect of diagnosis, connectivity type and their interaction, with connection type modelled as a repeated measure and age, sex and image quality metrics included.

Results: Connectivity strength ($\chi^2(2)=8267, p<0.001$) and temporal stability ($\chi^2(2)=15, p<0.001$) were significantly related to connection type. Post-hoc tests revealed homotopic connections were stronger and trending towards being less temporally stable than other types. No significant effect of diagnosis or interactions between diagnosis and connection type were found (all $p>0.05$).

Conclusion: Preliminary results indicate that FC of different connectivity types does not differ between children with different NDDs. Future analysis will examine the relationship of cross-disorder symptoms to connection types and whether FC within specific domains relate to clinical symptoms.
Purpose: The aim of the present study is to investigate whether personality traits can modulate the brain’s activity in resting state by demonstrating differences in the five frequency bands: delta, theta, alpha, gamma and beta waves. Previous literature has studied the alpha band more extensively during resting state but the involvement of neural activity in personality remains largely unknown.

Methods: The subjects recruited for the study includes 42 healthy individuals (21 female, 21 males). The personality scores of the participants were scored using the NEO Five Factor Inventory (NEO-FFI). Resting EEG activity was recorded using a 64-electrode cap and Neuroscan for 15 minutes.

Results: The results extracted from using a one-way Anova demonstrated that individuals who scored high on extraversion had higher averages of theta activity in the right frontal area. Individuals that scored high on openness were found to have lower averages of delta activity in the left parietal area. Individuals who scored low on agreeableness had higher averages of delta activity in the right frontal area and beta -2 activity in the left occipital area. Individuals high on conscientiousness were found to have higher delta activity in the right parietal area. Individuals high on neuroticism displayed higher theta activity in the right parietal area.

Conclusions/Implications: The results show that personality traits can be related to patterns of resting regional brain activity. Thus, if personality can be quantified using brain wave frequencies, then an EEG can act as diagnostic tool in objectively assessing personality and diagnosing personality disorders in the future.
Purpose: Virtual environments (VE) are increasingly being studied in the assessment and treatment of various cognitive impairments. VEs offer potential opportunities for cognitive rehabilitation in providing individualized training programs and environments mimicking the real world. Further, navigation experience has been shown to correlate with structural volume change in hippocampal regions important for detailed memory, thus we hypothesized that individuals with memory impairments may benefit from virtual navigation experience. A scoping review was conducted to map the recent literature.

Methods: OVID Medline, EMBASE, and CINAHL databases were systematically searched for publications between 2012 - 2017. Studies were included if they utilized a virtual navigation task as a rehabilitation intervention in adults with cognitive impairments including memory complaints in order to improve spatial memory or wayfinding abilities.

Results: 338 studies were screened and 8 were included in the review, including only two RCTs. Improvements in subscales of spatial memory were consistent across 7 of 8 studies, however there was significant heterogeneity in measures used across studies with only 6 of 35 used more than once.

Conclusions/Implications: There is a dearth of high quality studies examining the effects of virtual navigation tasks, as the majority of studies were case reports or series studies. Standardization of measures used in the assessment of outcomes will help to compare outcomes in future work in this area. Given the state of the technologies available, clinicians can now utilize virtual environments to provide cognitive scaffolding, strategically mitigating cognitive or physical demands imposed by the real world.
Validating A New Serum Anticholinergic Assay (SAA) in Older Healthy Individuals

José Nobrega: Centre for Addiction and Mental Health, University of Toronto; Roger Raymond: Centre for Addiction and Mental Health; Sara Gambino: Centre for Addiction and Mental Health; Bruce G. Pollock: Centre for Addiction and Mental Health, University of Toronto; Tarek K. Rajji: Centre for Addiction and Mental Health, University of Toronto

Purpose: A new serum anticholinergic assay (SAA) assesses anticholinergic activity specifically at muscarinic M1 receptors (M1). This study aims at assessing cognition before and after administering an anticholinergic drug, scopolamine and its relationship to SAA.

Methods: Cognitively healthy participants, aged 50 and older, received a single dose of 0.4mg of IV scopolamine. Cognition and SAA levels were measured before and 30 minutes after receiving scopolamine.

Results: 10 participants were recruited but only nine (F = 7; mean age = 69.8, SD = 9.0) completed the study as one participant experienced significant upper GI symptoms. Following scopolamine, participants experienced increase in SAA levels (SAA pre = 0.91 , SD = 0.98 vs. SAA post = 12.0, SD = 3.70; t-test (df = 8) = 9.6, p < 0.001) and decline in Working Memory (Pre = 25.5, SD = 14.8 vs. Post = 45.7, SD = 27.8; t-test (df = 8) = 2.4, p = 0.047). In addition, there was an association between change in SAA and change in Working Memory (Spearman’s rho = 0.72, p = 0.029). There were declines in other cognitive functions, and an association between change in SAA and change in executive function and episodic memory.

Conclusion: Scopolamine had a negative effect on multiple cognitive measures, particularly working memory. Change in working memory and its relationship to change in anticholinergic activity at M1 is consistent with previous studies of clozapine effect on cognition in patients with schizophrenia.
## Abstract

**Purpose:** When transcranial magnetic stimulation (TMS) is applied to the motor cortex it produces a TMS-induced motor evoked potential (MEP) – as recorded through electromyography (EMG). When TMS is applied to the dorsolateral prefrontal cortex (DLPFC), a TMS-induced cortical evoked potential (TEP) is produced that is recorded through electroencephalography (EEG). Based on previous studies we know that patients with schizophrenia demonstrate deficits in both TEP and MEP responses. Moreover, we know that patients with schizophrenia also show abnormalities in their resting state EEG compared to healthy subjects. What remains to be demonstrated is whether there is an association between these different types of deficit in patients.

**Methods:** Patients’ resting state EEG has been collected. In addition, data from several EMG protocols – including short-latency intra-cortical inhibition (SICI), long-latency intra-cortical inhibition (LICI), and cortical silent period (CSP) – have been obtained and analyzed, in order to compute the TEP modulations by SICI, LICI, and CSP.

**Results:** The preliminary analyses show a difference between the healthy controls and schizophrenia patients in terms of the TEP modulation by different EMG protocols, as well as a trend towards a correlation between the deficits in the resting state EEG and the EMG effects.

**Conclusion:** The preliminary results are showing a trend towards a correlation between the deficits in the resting EEG and the EMG deficits, in which case a simple resting state.

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### Co-Authors

Dr. Zafiris (Jeff) Daskalakis

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### Abstract Title

Relation between deficits in resting state EEG and TEP modulation by EMG in schizophrenia patients

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### Research Theme

Magnetic seizure therapy (MST) for treatment resistant schizophrenia.
Expected anxiety change: The role of distress tolerance and intolerance of uncertainty among treatment seeking individuals with social anxiety disorder

Purpose: Distress tolerance (DT) is the ability to withstand aversive or distressing internal states. Intolerance of uncertainty (IU) is difficulty tolerating the outcome of uncertain situations. DT and IU interaction has been shown to predict social anxiety symptom severity. The purpose of this study is to examine the associations between social anxiety severity, expectancy for changing anxiety, DT, and IU within a clinical social anxiety disorder (SAD) population.

Methods: Participants diagnosed with SAD based on the SCID-IV (N = 56) completed 12 weeks of manualized CBT for SAD. Participants completed pre-treatment measures of DT, IU, expectancy to change anxiety (anxiety change expectancy scale), social anxiety symptom severity (SIAS) pre/post treatment, and ACES at sessions 4, 8, and post-treatment.

Results: A repeated measures ANOVA on pre/post-treatment social anxiety severity showed a significant decrease, F (1, 55) = 15.42, p < .05). Neither DT/IU predicted ACES at week 4, 8, or post-treatment, all ps > .05. Pre-treatment SIAS, IU (t = 5.32, p < .001) and ACES (t = 3.70, p < .001) were significant predictors, and DT (t = -2.75, p < .01) was not. For post-treatment SIAS, DT (t = -2.75, p < .01) was the sole significant predictor.

Conclusions/Implications: DT and IU have differential relationships with expectancy for anxiety change and social anxiety severity. The importance of DT and IU varied with state of treatment.
Background: Mild traumatic brain injury (mTBI) represents an important concern in combat military personnel. These individuals also show elevated rates of physical violence, PTSD, and alcohol misuse post-deployment. mTBI has been shown as a potential risk factor for violence and mental health problems. However, the relationship between these variables in military personnel has not been investigated to this date.

Method: This study used cross-sectional data from a 6043 UK male military personnel deployed to Iraq and Afghanistan since 2003. Data was collected on socio-demographic and military characteristics, childhood antisocial behaviour, mTBI, recent physical violence, and PTSD and alcohol misuse in the last year.

Results: The prevalence of mTBI was 4.7%. mTBI was associated with physical violence post-deployment (aOR=1.87, p=0.039), symptoms of PTSD (aOR=3.07, p=0.002), and alcohol misuse (aOR=1.93, p=0.009). Combat role was a significant risk factor for deployment-related mTBI (aOR=2.38; p=0.0001) and recent physical violence (aOR=1.86, p<0.001). Adjusting for mTBI eradicated the association between combat role and physical violence (aOR=1.1, p=0.723). Adjusting for PTSD and/or alcohol misuse, also eradicated the association between mTBI and physical violence (aOR=1.36, p=0.337).

Conclusion: mTBI may be a mediator between combat exposure and violence, though this needs to be further explored using longitudinal data and mediation analyses. The relationship between mTBI and physical violence may be explained by its association with PTSD and alcohol misuse. These findings highlight the importance of timely assessment and management of mTBI during deployment, and continued vigilance for PTSD and alcohol misuse at homecoming.
Purpose: Bipolar disorder (BD) is associated with premature onset of cardiovascular disease. Hypertension and obesity are risk factors that cause arterial stiffness, leading to higher microvascular pulsatility and stress on capillaries. Cerebral microvascular damage appears as white matter hyperintensities (WMH) and is common in adult BD. This study uses blood oxygenation level dependent (BOLD) MRI to identify small vessel pulsatility index (SPI) in adolescent BD. Based on reported elevated SPI in WM in small vessel disease (SVD), we predict similar findings in BD.

Methods: Patients and controls were scanned using a 3T Philips scanner to obtain T1-weighted and BOLD images. BOLD data were preprocessed using CONN toolbox. SPI was calculated as the percentage of temporal coefficient of variation of BOLD signal in WM, and between-group differences were investigated. Body mass index (BMI), blood pressure and global functioning were also measured.

Results: We found higher SPI in periventricular and deep WM regions in BD compared to controls (p < .05). BMI correlated with SPI in both groups (r = .34). Pulse pressure correlated with SPI in controls (r = .33), while global functioning correlated with SPI in BD (r = -.41).

Conclusions/Implications: We found elevated SPI, reflecting early microvascular dysfunction, in WM among adolescents BD, in regions overlapping those where WMH are commonly reported in adult BD. Prospective studies are warranted, as are studies combining functional MRI with structural connectivity imaging to examine the link between SPI and impaired functioning in adolescent BD.
Purpose: The Prevention of Alzheimer’s Dementia with Cognitive Remediation plus Transcranial Direct Current Stimulation in Mild Cognitive Impairment (MCI) and Depression (PACT-MD) study is a longitudinal, multi-site clinical trial aimed to prevent or delay the onset of cognitive decline. The study aims to recruit 375 adults, 60 and older, with a diagnosis of MCI or a depression history. The aim of the current analysis is to determine the efficacy of various recruitment methods of older adults, which may increase the effectiveness of clinical trials in this population.

Methods: Three recruitment strategies were compared: (1) community presentations, (2) physician referrals and (3) targeted advertising. Additionally, common factors that may lead to improved recruitment were identified from each participating site. Across sites, clinics were grouped into two types, with the main distinguishing factor being the referral process.

Results: The results suggest that physician referrals represent the most efficient recruitment method for this population, with an estimated 35.6% enrollment rate. Community presentations resulted in a 27.9% enrollment rate, followed by an estimated 24.4% enrollment rate from targeted advertisements. With respect to clinic types, one type (2 clinics, 5 physicians) accepted self-referrals and had an enrollment rate of 16.8% per physician. The other type (3 clinics, 7 physicians) required a GP referral and an enrollment rate of 13.2% per physician.

Conclusions: The findings suggest that while all tested strategies may represent a viable option for recruitment of older persons, physician referrals may be superior to others. Self-referrals may also provide an added advantage.
Purpose: To describe the current parameters of publicly funded drug and alcohol treatment within the DATIS system. To characterize current trends in treatment-seeking for substances of abuse and sociodemographic characteristics of addiction treatment clients.

Methods: This study involves a descriptive analysis of the DATIS database. DATIS includes client-based data about individuals treated in approximately 200 specialized programs available through Ontario’s publicly funded addictions agencies. These agencies provide withdrawal management, community-based and residential treatment services. The study will start by describing the patients, presenting substance problems, and treatments received in the DATIS system.

Results: Preliminary results indicate that in 2016, 53,721 clients were provided through DATIS. In approximately half of client presentations (N = 27823, 51.8%), alcohol was self-identified as the primary substance of concern. In these appointments there was no other substance of concern identified nearly half the time (N = 13494; 48.5%). Opioids represented 11.8% (N = 6351) of the primary presenting substances in 2016, increased from 7.5% (N = 3753) in 2007, representing a 57% increase in the proportion of opioid-related cases.

Conclusions and Implications: DATIS is a rich source of drug treatment information for a publicly funded health care system, which serves a diverse population. Alcohol was the most common primary substance related to treatment. Opioid-related treatment increased substantially over the study period. This descriptive analysis is important so that DATIS can be used to understand and improve substance use treatment in Ontario.
### Full Abstract

**Purpose:** The goal of this study, which is ongoing, is to examine the potential clinical efficacy of a consumer grade EEG-based biofeedback device called “Muse” to reduce symptoms of obsessive compulsive disorder (OCD) and underlying cognitive vulnerability.

**Method:** Participants are randomized to one of two groups: 1) 8-week waitlist control condition or 2) 8-week mindfulness treatment condition (i.e., “Muse”). Participants in the Muse condition receive the EEG headset that connects with their smartphone, providing guided meditation practices with auditory feedback. Participants in the Muse condition engage in regular mindfulness practice during each week across the 8-week intervention and complete a brief online survey regarding their experience during the mindfulness practice, once per week. Participants attend three sessions during the eight week protocol; each session involves a) completing self-report questionnaires assessing OCD symptoms, mindfulness and thought control strategies and b) completing a brief mindfulness practice using the Muse EEG headset. The experimental design is a 2 (treatment condition) by 2 (assessment phase: baseline (week 0), post-treatment (week 8)) repeated measures factorial design with random assignment.

**Results:** Pilot data involving 20 participants (N=11 Muse, N=9 Control) was examined. A repeated measures ANOVA indicated a significant time (week 1 vs. week 8) by condition (Muse vs. Control) interaction with a Bonferroni correction involving OCD symptom improvement over 8 weeks, favoring the Muse condition: F (1,16) = 8.28, p < .05; Wilk's Λ = 0.659, partial η² = .341, with a large pre-post effect size (Cohen's d = 1.25). Further, examination of EEG data indicated there is a significant difference when examining “percentage calm” during mindfulness practice sessions (F (1,19) = 3.98, p < .05; Wilk's Λ = 0.834, partial η² = .271). When examining decreased “mind wandering” during mindfulness practices, there were significant band power differences within the TPO analogous electrode site (ipsilateral) in Theta band frequencies (F (1,15) = 5.27, p < .05; Wilk's Λ = 0.656, partial η² = .345) and a significant trend emerged when examining Alpha band frequencies (F (2,15) = 4.79, p = .06; Wilk's Λ = 0.67, partial η² = .32) favoring the Muse condition.

**Conclusions/Implications:** The current findings provide preliminary pilot support for the potential clinical benefits of an EEG based biofeedback device that provides guided meditation practices for patients with OCD. The theta and alpha band waveforms have historically been associated with achieving meditative states and power amplitude changes characterizing the mental state of mind wandering. This approach may be helpful in terms of promoting OCD symptom alleviation, decreasing mind wandering, and also providing insight into cognitive processes related to symptom maintenance and alternatively, successful symptom management.
Purpose: Individuals with schizophrenia have high rates of diabetes and receive poor care. We aim to investigate the factors which impact diabetes care quality in patients with schizophrenia.

Methods: A retrospective cohort study of Ontario administrative health records in adults with schizophrenia and diabetes on April 1, 2011. Patients were divided into groups depending on how many of the three guideline-concordant diabetes care procedures they received in a two-year period. Optimal care was defined as having all three of the following in a two-year period: 4 HbA1C tests, 1 eye test and 1 cholesterol test. Demographic, clinical and service utilization characteristics were compared across three levels of diabetes care (0 vs. 1, 2, or 3 diabetes tests received) using multinomial logistic regression odds ratios.

Results: Among 26,259 individuals in the Province of Ontario, Canada with diabetes and schizophrenia, 4019 (15.3%) had none and 6356 (24.2%) had all three diabetes care tests. The overall number of primary care visits was not associated with diabetes care quality. However, primary care visits for non-mental health reasons only was strongly associated with better care [0 vs. 1 OR 2.68 (95%CI 2.38-3.01), 0 vs. 2 OR 4.50 (95%CI 4.00-5.10) and 0 vs. 3 OR 6.37 (95%CI 5.51-7.36), p-value = <.0001].

Conclusions: The results suggest that primary care physicians who focused on the medical issues of our schizophrenia population provided better care, whereas those focused on psychiatric issues were less likely to adhere to diabetes quality guidelines.
Pharmacological Manipulation of Cortical Inhibition in the Dorsolateral Prefrontal Cortex: a TMS-EEG Study

Purpose: The dorsolateral prefrontal cortex (DLPFC) is an essential brain region involved in several cognitive domains such as learning and memory. Abnormalities in DLPFC function are observed in brain disorders such as Alzheimer’s disease, depression, Parkinson’s disease, and schizophrenia. To better understand the pathophysiology of these psychiatric disorders, we assessed the pharmacological modulation of cortical processes within the DLPFC using dual transcranial magnetic stimulation-electroencephalography (TMS-EEG) and a GABAB-mediated long-interval cortical inhibition (LICI) paradigm.

Methods: 12 healthy participants attended 5 sessions of LICI in a random order. Each session was preceded by the administration of placebo or one of four active drugs: levodopa (L-DOPA), baclofen, dextromethorphan, and rivastigmine. LICI was measured at pre-drug and post-drug states, with post-LICI administered after the drug reached peak plasma levels.

Results: The data indicates an increase in LICI after the intake of baclofen and a decrease after rivastigmine when compared against placebo. There was no significant change in LICI after the intake of L-DOPA or dextromethorphan. Furthermore, TMS upon the left DLPFC inhibited cortical activation in the right DLPFC, with no specific drug effects found.

Conclusions/Implications: Our preliminary results suggest that baclofen enhances LICI in the DLPFC. These findings replicate and extend to TMS-EEG studies which assessed the effect of baclofen on LICI in the motor cortex. As LICI has been shown to be dysfunctional in a number of psychiatric disorders, these findings suggest that drugs targeting GABAB receptor activity may have a therapeutic role in reversing these deficits.
Purpose: Morbidity and mortality after deliberate self-harm (DSH) are high, so mental health care shortly after DSH is recommended, but rates and impact are unclear.

Methods: Using population-level health data we determined the association between a mental health visit and risk for repeat DSH with or without intensive care unit (ICU) admission or all-cause death.

Results: Over two years, 23,140 individuals had emergency department treatment for DSH. Within 30 days, 10.7% had a family physician mental health visit, 17.1% visited a psychiatrist, 3.6% visited both and 68.6% neither. Individuals who received mental health follow-up had more chronic and severe mental illness and higher acuity DSH. Over five years, repeat DSH occurred in 4792 (20.7%). Repeat DSH was more common in those who had a mental health visit within 30 days. Adjusting for baseline characteristics attenuated these differences. Similar results were found for DSH with ICU admission (5.0%) and death (7.6%). More frequent follow-up was not associated with better outcome. Timely access to mental health care after DSH was poor at 31%.

Conclusion: Follow-up care had virtually no association with subsequent risk, so treatment as usual is insufficient. Post-DSH care augmented with evidence based interventions is required. Other models of care will be reported.
Introduction: Cognitive deficits are a core feature in individuals with schizophrenia (SCZ) that is associated with severe consequences on their quality of life and recovery process. Antipsychotic medications appear to show minimal effects on cognitive symptoms of SCZ, including clozapine (CLZ), which is generally recognized to be the most effective antipsychotic. One explanation for the mixed effects of CLZ on cognition has been proposed to involve (1) the conversion of CLZ to a metabolite (NDMC) by a metabolizing enzyme (CYP1A2) and (2) their opposing effects on the muscarinic 1 receptor (CHRM1) that supports cognitive processes. Higher ratios of CLZ/NDMC have been associated with poorer working memory performance, indicating CLZ/NDMC ratio as a strong predictor of cognitive effects.

Objectives: The present study will investigate the genetic variants of the CYP1A2 and CHRM1 genes contribution to clozapine/NDMC ratio and improvements in cognitive performance, respectively.

Methods: Individuals with SCZ on CLZ monotherapy (n=105) will be assessed for performance on seven cognitive domains (MATRICS Consensus Cognitive Battery), CLZ/NDMC ratio, symptom scores (PANSS), and education level. Genetic analyses will include genome-wide coverage of genetic markers to allow for extensive coverage of the genetic variation in the two target genes.

Progress: Preliminary analysis on our first cohort (n=30) revealed, that after adjusting for age, education and CLZ/NDMC ratio, rs2075748 of the CHRM1 gene was significantly associated with working memory.

Implications: This study has major clinical relevance, as the optimal CLZ/NDMC could be achieved through dietary or pharmacological interventions for the improvement of cognitive symptoms while on CLZ.
Purpose: Functional connectivity differences in the cortico-striatal-thalamic-cortical (CSTC) circuit, as well as altered subcortical region volumes have been observed in schizophrenia. In this study, magnetic resonance imaging (MRI) was used in a large child and youth sample aged 11-21 years (n = 1062) to examine this circuit in children with psychosis spectrum symptoms (n = 297).

Methods: Structural subregions of the thalamus and striatum were identified using the segmentation tool MAGeT Brain. Functional subregions were segmented based on resting-state functional connectivity with brain networks. Average BOLD signal time series from functional subregions were correlated vertex-wide with cortical surfaces. FSL’s PALM was used to examine main effects and interactions between PS groups and sex on functional connectivity using TFCE. Age, in scanner motion, and WRAT score were included as covariates and results were corrected for using FWER.

Results: There was a consistent pattern of significantly increased volumes in girls with PS symptoms, but decreased volumes in boys with PS symptoms compared to non-PS youth in multiple thalamic nuclei (F = 11, pFDR = 0.034) and bilateral posterior putamen (F = 6.8, pFDR = 0.058). Overlapping with striatal structural findings, there was a sex-specific finding of decreased functional connectivity in PS boys between the right posterior putamen and occipital cortex (pFWE = 0.004).

Conclusions: Our findings indicate sex-specific differences in the CSTC circuit in youth and may provide insight into diverging neural mechanisms underlying the development of psychosis and differences in clinical features between males and females.
Purpose: The current study investigated neuroanatomical correlates of impulsivity in two clinical groups with high trait impulsivity: antisocial personality disorder (ASPD) and bipolar disorder (BD), relative to healthy controls, and assessed linear relationships between brain structure and impulsivity.

Methods: Structural magnetic resonance imaging data were collected from 23 adults with ASPD, 16 adults with BP, and 24 healthy controls. We used voxel-based morphometry to investigate differences in gray matter (GM) volume in key areas implicated in impulsivity, namely the anterior cingulate cortex (ACC), ventromedial prefrontal cortex (vmPFC), and insula. In addition, we assessed for differences between the groups in the relationship between GM volume and well-established measures of impulsivity – the Iowa gambling task and Barratt Impulsivity scale (BIS).

Results: Both clinical groups showed lower GM volumes relative to the control group in bilateral Insula, bilateral vmPFC, and right ACC. In all regions of interests, the BD and control groups displayed a positive, and the ASPD group a negative, correlation between scores on the Iowa gambling task and GM volume. In contrast, in the right lateral regions of interests, the control group showed a negative, and the ASPD group a positive, relationship between GM volume and BIS scores, whereas the BD group showed no correlation.

Conclusion: These results confirm previous associations between impulsivity and prefrontal brain regions in healthy populations, but demonstrate a divergent pattern for individuals with ASPD, and to some extent, patients with BD. The findings suggest that structural brain changes in these populations may be mediated by impulsivity.
Purpose: Late-life depression (LLD) is a growing global public health issue due to demographic changes. LLD is associated with cognitive functioning impairment. Deep repetitive transcranial magnetic stimulation (rTMS) is an emerging treatment for depression in younger adults associated with improved cognition; however, the impact of deep rTMS on cognition in LLD has not been explored.

Methods: We randomized adults 60-85 years (n=52) with major depressive disorder (MDD) to sham or active deep rTMS (H1 coil, 6012 pulses, 18Hz, 120% resting motor threshold) delivered over the dorsolateral and ventrolateral prefrontal cortex five days per week over four weeks. Cognitive outcomes were the Repeatable Battery for the Assessment of the Neuropsychological Status (RBANS) and two Delis-Kaplan Executive Function System (DKEFS) subscales: Color Word Interference (DKEFS-CWI) and Trail Making Test (DKEFS-TMT). The analysis used a linear mixed effects model for repeated measures and the primary outcome was group x time interaction.

Results: Active rTMS was superior to sham at achieving remission. The effect of time did not differ between active and sham deep rTMS for cognitive outcomes. We found a significant effect of time for: total RBANS (F=37.1;d.f.=44.6;p<0.001); RBANS subscales immediate memory (F=12.5;d.f.=45.1;p<0.001), delayed memory (F=45.8;d.f.=45.1;p<0.001), language (F=9.6;d.f.=47.3;p=0.003); and DKEFS-CWI (inhibition condition) (F=9.5;d.f.=45.7;p=0.003). All changes represented improvements from baseline.

Conclusions: There was non-specific improvement in cognitive functioning in LLD with both sham and active deep rTMS. Despite improvement in depressive symptoms, active deep rTMS was not associated with improved cognitive functioning compared to sham. Further analysis of cognitive changes in remitters compared to non-remitters is warranted.
Purpose: Our objective in this review was to characterize the existing literature on the psychiatric sequelae after a neuro-surgical resection of adult brain tumors through a scoping review.

Methods: We conducted a scoping review according to a procedure outlined by Arksey and O'Malley (2005). All literature was eligible for inclusion, including empirical (randomized control trials, case-control studies, cohort studies, cross-sectional studies) and non-empirical (reviews, commentaries, editorials, case series and reports, expert opinions). We included studies of brain tumor patients within hospitals, any health care institutions, private medical practices, and followed in community clinics.

Results: We had a total of 85 articles included in this review with the majority being empirical (n=69) rather than non-empirical (n=16).

Conclusions: Cognition was best studied among all psychiatric symptom clusters, though limited by lack of systematic study, in contrast to other bodies of literature in the neurosurgical field i.e. epilepsy and stroke, where larger extent of resection and particular locations yield worse cognitive outcomes. However, the literature seems to agree that there is a transient worsening that persists up to 3 months, and even up to 6 months in various cognitive domains, with the most distinct issues appearing in attention and verbal working memory. Recovery is thought to be related to neuroplasticity. Long term results are variable, but generally depend more on location and involvement of the eloquent cortex than tumor grade. Depression has also received a good amount of attention though prevalence is variable, with the HADS yielding the closest results to the golden standard of a clinical interview (15% vs 16%). Location of tumor resection, in particular anterior frontal and dorso-lateral tumor, seem related to symptoms of depression. Anxiety is high both in short and long-term outcomes, and appear to be related to the level of grading and malignancy of the tumor. Obsessive compulsive symptoms have also been reported and have been increased after resection. Psychosis, delirium, and personality have all been mentioned in some studies, but have poor data for extrapolations. The scoping review provides an overview of major gaps in the literature and certain questions that could be areas of focus in research and clinical care.
Purpose: Suicide is the second leading cause of death among Canadian children and adolescents. Youth who present at an Emergency Department (ED) for suicidal ideation and risk behaviours (SRB) are at increased risk for completed suicide. Thus, youth who present to the ED with acute SRB present an opportunity for secondary prevention of suicide. This study will be the first randomized controlled trial of a suicide prevention intervention for youth in Canada.

Methods: This study tests the effectiveness of a manualized, patient- and family-centered suicide prevention intervention for the ED developed with youth and family/caregiver input. 128 youth aged 12 to 18 years and their primary caregivers will be randomized to receive either the manualized intervention or care navigation, in addition to treatment as usual. The intervention consists of a 1-hour individual therapy session followed immediately by a 1-hour family therapy session, administered weekly for six weeks. Care navigation consists of weekly telephone calls to facilitate connection to ongoing mental health resources. The primary outcome is change in SRB as measured by the Suicide Ideation Questionnaire (SIQ)-Jr. Secondary outcomes include change in depression and anxiety symptoms, family conflict, and unplanned medical visits.

Results: Results will be analyzed using data collected at 6 weeks and 6 months post-randomization.

Implications: This study will provide the preliminary results needed to inform a multi-centre youth suicide prevention study and instruct the provincial and national youth suicide prevention strategy.
Purpose: Genetic evidence implicates complement pathway activity as a cause of Alzheimer’s disease (AD); however reports of complement proteins measured in peripheral blood and cerebrospinal fluid (CSF) have conflicted. This meta-analysis seeks to quantitatively summarize the peripheral blood and CSF complement pathway data.

Methods: Literature was searched using Medline, PubMed, Embase, PsycInfo, Cochrane Controlled Trials Register, and Cochrane Database of Systematic Reviews. Original peer-reviewed studies measuring complement and complement regulator protein concentrations in AD and healthy control subjects were included. Mean (± standard deviation) concentrations for AD and control subjects were extracted and combined in random effects models.

Results: 69 studies measuring either CSF or peripheral blood protein concentrations have been included thus far. Preliminary results show an increase in clusterin concentrations in CSF (N=437/371, Z=4.18, p<.001; I²=31%) and plasma (N=1269/1651, Z=2.04, p=.02; I²=97%) in AD compared to healthy elderly, and a nominal difference in CSF serum amyloid P levels (N=143/79, Z=1.95, p=.05; I²=0%) between AD and healthy elderly.

Conclusions/Implications: Complement proteins are elevated in AD blood and CSF; since clusterin inhibits the activity of complement proteins at the end-stages of the complement cascade, the results implicate increased complement activity, but also increased negative complement regulation, in AD.
Background: Complexity is a term used by clinicians to identify the needs of patients with multiple illnesses and by institutions and funding agencies to determine resource allocation. No standard definition of “complexity” exists across the mental health care system.

Purpose: 1) to review the interpretations of complexity in mental health from economic, policy, health care provider, and patient perspectives and 2) to examine the impact of these definitions on health service delivery.

Methods: A critical literature review was performed using search terms related to defining complexity and “complex patients” in health care and mental health care.

Results: The health economics perspective defines patients with complex mental health needs as mental health high-cost users. The Toronto Central LHIN characterizes patients with complex mental health needs as those who have co-occurring medical and mental health conditions, frequently uses governmental resources, and has little social capital. The care provider perspective defines complexity by four dimensions: medical complexity, socioeconomic vulnerabilities, psychiatric comorbidities, and challenging patient behaviours. Frequent service users in the emergency department defined aspects of programs that may help address their needs to include system navigation, advocacy, intermediation, and practical needs assistance. Each stakeholder’s perspective on complexity is limited, certain perspectives are prioritized, and a cohesive understanding of complexity in mental health care is yet to be established.

Conclusions: Participatory action methodology can inform a co-construction of a cohesive definition of complexity from multiple stakeholders that can match clients to existing services, integrate and improve care, and inform the development of new services.
### Full Abstract

**Purpose:** Borderline Personality Disorder (BPD) patients have a high lifetime prevalence of Major Depressive Disorder (MDD). However, it has been previously found that there are poorer outcomes of ECT and antidepressants among this population. Repetitive transcranial magnetic stimulation (rTMS) is an emerging treatment for medication-resistant depression. In the present study we looked at the efficacy of dorsomedial prefrontal cortex (dmPFC) rTMS in treatment resistant MDD co-occurring with BPD.

**Methods:** 20 patients meeting the diagnostic criteria for MDD with a current major depressive episode and co-occurring BPD were recruited. Subjects were randomized to receive either 15 days of twice-daily 20 Hz rTMS treatment of the dmPFC then 15 days of sham rTMS therapy, or vice-versa, in a cross-over design. Primary outcome was reduction in depressive symptoms as measured by Hamilton Rating Scale for Depression (HRSD), which was administered on a weekly interval. A repeated measures ANOVA was conducted that examined the effect of group allocation and actual treatment received on HRSD score.

**Results:** 80% of patients completed the study, with 1 SAE unrelated to the treatment. There was a statistically significant effect of treatment on HRSD over time, F(3,42)= 3.393, p= 0.026 and no significant effect of period on HRSD over time, F(1,14)= 1.1415, p= 0.254.

**Conclusions:** Our findings support dmPFC rTMS as a potential treatment for MDD in patients with BPD. The treatment was well tolerated. Limitations include small sample size and the crossover design of the study. Further replication with larger sample size and adequate washout period is warranted.
Abstract Title
Using artificial intelligence to improve online support group services in cancer

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Full Abstract
Background: The proliferation of online support groups (OSG) meeting the demand of mental health services warrants scientific evidence to inform their efficacy and safety. We propose to design an artificial intelligence (AI)–based system titled ‘Individualized Person-Centered Outcome Measures (IPCOM)’ to help enhance the safety and impacts of professional-led text-based OSG in cancer. IPCOM will serve as a “co-facilitator” by monitoring the patient engagement in the groups through analysis of texts posted during OSG sessions. IPCOM will: a. identify participant(s) at-risk for significant distress or dropout and alert therapists for follow-up and b. generate emotion profiles for better client-treatment matching for other services.

Objectives: We will 1) develop IPCOM, 2) assess its acceptability and face validity using therapist focus groups, its consistency (convergent & construct validity) with standardized measures and its predictive power for emotional distress and dropout.

Methods: Existing text data generated by participants with breast or gynecological cancer will be used to train IPCOM to recognize behaviors and subtle patterns associated with emotional distress and/or dropouts. Therapist feedback will be used to improve IPCOM’s accuracy until a high level of performance is reached. Next, 320 women with breast or gynecologic cancer will be recruited to test IPCOM as a “co-facilitator”. IPCOM analytics will be compared to standardized measures on its ability to describing participant emotional states and predicting significant distress and dropout.

Implications: IPCOM enhances therapist capacity to address the needs or concerns of individual group members, which can ultimately improve patient satisfaction and reduce dropout rates.
Purpose. Subjective reports continue to guide treatment decisions for late-life depression (LLD), and a need for objective biomarkers that can be leveraged to predict treatment outcome at the individual level remains. Transcranial magnetic stimulation (TMS) can be used to non-invasively probe neurophysiology, including cortical inhibition, excitation and neuroplasticity. However, the neurophysiological correlates and predictors of treatment response in LLD remain understudied.

Methods. In 74 LLD patients, we used single- and paired-pulse TMS paradigms to study changes in cortical excitability and neuroplasticity with Effexor treatment, and assessed the accuracy of clinical and TMS measures in predicting response to Effexor treatment. TMS measures were collected before and after 12 weeks of open-label Effexor. A genetic algorithm was used to select the most predictive model features, and machine learning models were used to explore the neurophysiological biomarkers of treatment response.

Results. The pre-treatment measures most predictive of clinical response included TMS measures of neuroplasticity and cortical excitability, together with clinical measures of symptom severity, treatment resistance and duration of depressive episode. These features achieved 75% predictive accuracy when applied in k-nearest neighbors and support vector machine models. No significant pre-post treatment changes in cortical excitability or plasticity were observed in treatment responders.

Conclusions & Implications. These findings indicate that baseline TMS and clinical measures, when combined with machine learning, may help predict the response of LLD patients to Effexor treatment. Going forward, the inclusion of other objective brain-based features may improve prediction accuracy as we transition towards a precision medicine approach in psychiatry.
Purpose: A study investigating the gut microbiome in healthy controls and patients with schizophrenia treated with antipsychotics

Methods: This study involves exclusively humans. We are recruiting 25 patients who are chronically treated with clozapine (at least 6 months) compared with 25 healthy controls matched for age, sex, BMI and smoking status. A second cohort will consist of 25 patients newly starting on clozapine and will be prospectively assessed for up to 6 weeks. The following study measures will be taken at baseline, and if applicable, at follow up visits: Clinical and Psychological Assessments, Anthropometric and Metabolic Indices, and the Gut Microbiome (fecal samples via microbial collection and stabilization kits)

Results: Since beginning recruitment, we have a total of 26 participants in the study across all study arms. The majority of our chronic patients are between the ages of 20 and 30, overweight/obese, and have low/average PANSS ratings. Preliminary analyses suggest differences in the relative abundance of gamma-Proteobacteria between schizophrenia patients and healthy controls.

Conclusion/Implications: It is too early to imply anything based on the preliminary data but this study will contribute to elucidate the role of the gut microbiome in schizophrenia and metabolic side effects. In addition, this might help to explore potential therapeutic targets for AP induced metabolic side effects.
**Abstract Title**
Evaluating the effects of single-session transcranial direct current stimulation electrode (tDCS) placement on cognition in Mild Cognitive Impairment (MCI) and mild Alzheimer’s disease (AD): A pilot study

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**Full Abstract**
Purpose: While single-session transcranial direct current stimulation (tDCS) is an emerging tool to predict response to therapeutic neurostimulation, little is known about optimal electrode placement for those with early cognitive impairment. The primary objective of this study is to evaluate the cognitive effects following a single session of bifrontal, bitemporal, and sham tDCS in Mild Cognitive Impairment (MCI) and mild Alzheimer’s disease (AD).

Methods: MCI and mild AD patients (N=13) were enrolled in a randomized, cross-over trial comparing single sessions of bifrontal, bitemporal, and sham tDCS (20 minutes, 2mA) with a 1-week washout period between stimulations. Outcomes included the Montreal Cognitive Assessment (MoCA), the Word Recall and Word Recognition subscales of the Alzheimer’s disease Assessment Scale-Cognitive, and the n-back. Repeated measures analyses of variance were used to analyse differences in cognitive change scores between stimulation groups.

Results: There was a statistically significant difference in 2-back accuracy between stimulation types (F(2,24)=4.75, p=0.02). Post-hoc analysis using Least Significant Difference correction revealed a statistically greater improvement in 2-back accuracy following bitemporal stimulation compared to sham (p=0.03) and bifrontal stimulation (p=0.03). There were no differences in 2-back accuracy between bifrontal and sham (p=0.91). No differences in MoCA, recall, or recognition were found between groups.

Conclusions/Implications: In our preliminary results, working memory improved following a single session of bitemporal tDCS compared to sham. Recruitment is ongoing (target sample; N=20). Single-session tDCS may be able to help predict optimal electrode placement and create a profile of responders to guide future personalized treatments with tDCS.
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<td>Effects of Tobacco Smoking Status on Verbal Learning and Memory in Schizophrenia</td>
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### Purpose

The prevalence of tobacco smoking is significantly higher in schizophrenia (SZ) compared to the general population. Nicotine exerts procognitive effects in SZ due to downstream modulatory dopaminergic effects associated with dysregulated nicotinic acetylcholine receptors (nAChR). Whether such effects vary as a function of smoking status and psychiatric diagnosis remains unclear. Thus, we examined effects of smoking abstinence and reinstatement on cognition in SZ and non-psychiatric individuals.

### Methods

Participants (15 SZ non-smokers, 15 non-psychiatric non-smokers, 14 SZ smokers, and 14 non-psychiatric smokers) underwent a randomized, placebo-controlled cross-over study (Wing et al., 2013; Kozak et al., 2018). A comprehensive battery was administered assessing cognitive functioning, including verbal learning and memory (Hopkins Verbal Learning Test-Revised, HVLT-R), on Day 2 (smoking satiated), Day 3AM (smoking abstinent) and Day 3PM (reinstatement).

### Results

A 2 (diagnosis) x 2 (smoking status) repeated measures ANOVAs with time as the within factor, and diagnosis and smoking status as the between-subject factors, was performed for HVLT-R. Significant 2-way interactions were found in the placebo condition (p<0.05); smoking abstinence produced a decline in verbal memory was most apparent in SZ versus control smokers, which was reversed by smoking reinstatement.

### Conclusions

Our preliminary findings demonstrate that tobacco smoking may selectively enhance verbal learning and memory in smokers with SZ. These findings may have implications for developing new interventions for cognitive deficits and tobacco use disorder in people with schizophrenia.
Purpose: There is increasing evidence that cannabis use is associated with depression and anxiety, and that abstinence from cannabis may lead to better outcomes. A previous study conducted in our lab found that successful 28-day abstinence from cannabis in patients with schizophrenia lead to significant improvements in symptoms of depression (Rabin et al., 2017. Schizophr. Res.) and a trend towards significance in improvements in symptoms of anxiety. In the present study, we sought to compare previous findings in the schizophrenia sample with preliminary data from a sample of cannabis users with Major Depressive Disorder (MDD).

Methods: We analyzed and compared clinical symptomology from 2 studies: (1) Dr. Rabin’s study of cannabis users with schizophrenia (n=19), and (2) an ongoing study of cannabis users with MDD (n=5). Primary outcome measures will include the Beck Depression Inventory II (BDI-II) and the Beck Anxiety Inventory (BAI).

Results: Dr. Rabin (2017) found significant changes in depression occurred across time in the abstinent group of patients with schizophrenia (F=4.36, p<0.03). However, the secondary analysis found no significant changes in anxiety measured across time according to abstinence status (F=2.138, df=1, p=0.163). These findings will be compared with the preliminary results of the current study, which will be analyzed after subjects complete their abstinence period.

Conclusions: Results from the schizophrenia sample indicate that depression, but not anxiety changes with cannabis abstinence in this population. Further research is needed to corroborate these findings using validated measures and well-controlled study designs to better detect clinical symptoms in cannabis users.
Purpose: Clozapine is associated with cognitive impairment and high anti-cholinergic burden. Its metabolite, N-desmethylclozapine (norclozapine), may buffer the cognitive impairments. Previous literature indicates that the ratio (CLZ/NCLZ) of concentrations of clozapine and norclozapine is inversely associated with working memory. We hypothesize that this trend will remain when assessing changes of the clozapine ratio and working memory over time.

Methods: Forty-nine subjects were selected from an ongoing longitudinal clozapine (Clozaril) study. Participants completed the brief neurocognitive assessment (BNA) which included 2 cognition measures: a letter-number span and symbol coding task. Participants were over 18 years old, on clozapine monotherapy, diagnosed with schizophrenia or schizoaffective disorder. Participants must have completed both cognitive measures and clozapine levels at 2 of the 3 visits. The raw scores were used to compute z-scores for global cognition and individual measures.

Results: The authors found that clozapine levels are significantly associated with worsening performance on cognitive measures over time. There was a trend with an increasing CLZ/NCLZ ratio predicting worsening global cognitive performance and letter-number span scores over time, however this is not significant. Higher clozapine doses are significantly associated with worsening global cognition, but it is non-significant for the individual cognition measures.

in cognition over time, but does not seem to extend to the ratio, possibly suggesting a

Conclusions/Implications: Based on the preliminary analysis, increasing concentrations of clozapine are significantly related to negative changes more complex picture. Polypharmacy, specifically the co-use of drugs with high anti-cholinergic burden, may also influence changing cognition among patients with schizophrenia.
Background: Schizophrenia (SCZ) is a severe, devastating disorder with a life-time prevalence of 1% irrespective of gender or ethnic group, treated primarily with antipsychotic (AP) medications. Despite clinical efficacy of APs, they are associated with severe side effects including antipsychotic-induced weight gain (AIWG).

Methods: We investigated n=201 schizophrenia or schizoaffective disorder patients of European and African American ancestry who were treated mostly with clozapine or olanzapine. Individuals were genotyped on the Infinium Omni2.5 BeadChip. We conducted genome-wide association analysis for AIWG defined primarily as the percentage of weight change from baseline. Additionally, we ran pathway, enrichment, network, and polygenic risk score analyses to investigate top genes using in silico methods.

Results: In the mixed sample, we observed genome-wide significant association between the diacylglycerol kinase beta (DGKB) variant (β=0.411; p=3.15×10^-9) and percentage of weight change. The association remained nominally significant in both Europeans (β=0.271; p=0.002) and African Americans (β=0.579; p=5.73×10^-5) for the same risk allele. In Europeans, the top variant (β=0.406; p=1.26×10^-6) was located upstream of the Stanniocalcin 2 (STC2) gene. Bayesian fine mapping suggested the variant nearby SNP upstream of STC2 (p=0.034; PHRED=3.691, posterior prob.=0.496) to be the most significant. We noticed no significant enrichment in metabolic pathways for SNPs, but our top genes (p<5×10^-5) were enriched in the GWAS catalog for risk of obesity (pmixed=0.018; pEuropeans=0.015) and schizophrenia (pmixed=0.006). Top genes also interacted with known risk factors for obesity (Glucose-6-Phosphate Dehydrogenase (G6PD)) and schizophrenia (NudE Neurodevelopment Protein 1 Like 1 (NDEL1)), and are targeted by microRNAs related to schizophrenia (mir-34a) and obesity (mir-19b). Polygenic risk score analyses did not provide support for major genetic overlap between obesity-related and lipid-associated SNPs and the risk of AIWG.

Conclusions: Our findings suggested that a variant in DGKB is associated with the AIWG in both African Americans and Europeans.
Introduction: Atypical antipsychotics (APs), though effective (1), are known to cause metabolic dysregulation, especially in youth (2). This observational study aims to understand changes in clinical presentation and quality of life (QoL) within the context of metabolic changes in AP-naïve youth during their first 3 months of treatment.

Methods: 10 participants between ages 12 and 35 were followed throughout their first 3 months of treatment with an AP for any indication in this pilot study. Investigators evaluated participants on metabolic indices, QoL (i.e. PedsQL), and clinical presentation (i.e. CGI). Nonparametric tests were conducted to investigate changes across individual variables.

Results: Metabolic indices are found to significantly worsen over the first 3 months of treatment, as seen through increases in weight, waist circumference, and BMI. Clinically, participants show an improvement in clinical global impression; however QoL remains unchanged within all subcategories, including psychosocial and general well-being.

Conclusions/Implications: AP-related metabolic side-effects may not impede upon early clinical improvement or impact QoL. Also, there does not appear to be a relationship between clinical presentation and QoL, where QoL remains neutral to positive. These findings propose that clinical presentation and metabolic side-effects may not be related to patient-perceived QoL. This could potentially be due to developmental status, meaning factors relating health and QoL in other populations may not apply in adolescents and young adults. These results are clinically relevant as they may point to a critical difference in how this younger population perceives metabolic side-effects of their AP treatment and potentially their illness overall.
**Abstract Title**
Sex differences in social communication abilities in ASD and ADHD

**Co-Authors**
Evdokia Anagnostou, Bloorview Research Institute, University of Toronto; Annie Dupuis, The Hospital for Sick Children, University of Toronto

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**Purpose:** Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD) are associated with social communication deficits, with the nature of sex differences being unclear. This study explored sex differences in social communication abilities in children with ASD and ADHD by using scores on the communication, leisure and social domains of the Adaptive Behavior Assessment System Second Edition (ABAS-II-Harrison et al. 2000). The study objectives were to determine: 1) Are there sex differences in scores for social communication items on the ABAS-II in children diagnosed with ASD? 2) Are there sex differences in scores for social communication across ASD and ADHD?

**Methods:** 1) To test for sex differences, a repeated measures logistic regression was performed on each domain across items within each diagnosis, after controlling for age and testing for an age by sex interaction. 2) Using 2-way and 3-way interactions, pairs of diagnoses were compared to test for sex differences across disorders.

**Results:** Significant sex by age interaction for ASD was observed in the communication (p=0.0045), leisure (p=0.0027) and social domains (p<0.0001), with males significantly improving faster in those domains with age (p<0.0001) compared to females. Sex by age interactions were significantly different between ASD and ADHD for the social and leisure domain, with ADHD females increasing and ASD females decreasing with age (p’<0.05).

**Conclusions/Implications:** Sex differences are seen within ASD, with males improving faster with age in social communication abilities versus females. Significant male improvement is seen in ASD and ADHD for communication abilities, indicating similarities across disorder.
### Immediate staff debriefing following seclusion or restraint use in inpatient mental health settings: a scoping review

**Abstract**

**Introduction:** Despite the increasing recognition that immediate staff debriefing is key in reducing seclusion and restraint use, and minimizing potential negative effects from witnessing or experiencing violence in inpatient mental health settings, there is a current gap in the literature in exploring both the academic and grey literature. Since implementation of immediate staff debriefing relies on organizational policies and guidelines, it is imperative to examine whether these documents align with existing studies on this topic.

**Aims:** To synthesize the academic and grey literature on immediate post-seclusion and restraint staff debriefing, and to highlight potential gaps that can inform mental health practice, policy, education, training, and research on violence and trauma prevention.

**Method:** A scoping review and content analysis of 42 documents (31 academic literature and 11 grey literature) was undertaken.

**Results:** The analysis identified several core components of immediate staff debriefing: terminology, type, critical reflection; iterative process; staff training; documentation; and monitoring. While these components were regarded as vital to the implementation of staff debriefing, they remain inconsistently described in the literature, with limited information on how to implement these into practice.

**Implications for practice:** Immediate staff debriefing is an important intervention not only to prevent future episodes of violence or seclusion and restraint events, but as a forum for staff to support each other emotionally and psychologically after a potentially distressing event. The core components identified in this review should be incorporated into the organization’s policies, practice guidelines, and training modules to ensure consistent conceptualization and implementation of the debriefing process at different levels of care.
### Full Abstract

Transcranial electrical stimulation (tES) is emerging as a probe and therapeutic intervention in Major Depressive Disorder (MDD). Preclinical studies in the visual and motor system suggest tES effects may be enhanced when the stimulation is synchronized with the underlying brain activity. A similar approach applied to prefrontal regions could potentially enhance tES potency in MDD. We have developed a closed-loop tES system that is able to record EEG and provide synchronized, phase-locked brain stimulation in real time. This preliminary study examines the effects of phase-locked tES in a cognitive-control paradigm in healthy individuals.

**Materials and Methods:** 20 healthy volunteers received 1-hour sessions of phase-locked tES or sham stimulation during a reinforcement learning task, followed by 15 minutes of event-related potential (ERP) testing on the same task. tES employed 2 mA square pulses, 5 ms duration, synchronized to Fz theta oscillations (4 Hz – 8 Hz) either during the peak or trough of the theta oscillation. The outcome measures for this study were learning rates and event-related potentials (ERP) associated with positive and negative feedback on the task.

**Results:** tECS successfully phase-locked to frontal midline theta, in-phase and out-of-phase. Differential modulatory effects were observed on ERPs for feedback on the reinforcement-learning task. Differential changes in learning rate parameters were observed in a subpopulation of participants.

**Conclusion:** Closed-loop TES of prefrontal regions, synchronized in- or out-of-phase to midline theta oscillations, is technically feasible and may modulate neural and behavioural measures of cognitive control. This technique may be suitable for follow-up investigation as a therapeutic intervention in MDD.

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**Department Division**

- Brain and Therapeutics

**Affiliation**

- Graduate Student (Masters or PhD Candidate)

**Setting**

- University Health Network

**Abstract Type**

- Poster Presentation

**Research Theme**

- Electrical Current Brain Stimulation

**Abstract Title**

- Synchronized transcranial alternating current stimulation (syntACS): a new method of modulating networks of the brain

**Co-Authors**

- José Zariffa, Jonathan Downar
Rationale: Patients coping with pulmonary arterial hypertension (PAH), a chronic life-limiting illness, may experience existential concerns about the meaning and value of life. Such concerns can be emotionally difficult for patients to acknowledge and disclose, although their expression can also be associated with clinical benefit. Purpose: To examine sequences in which patients with PAH approached or avoided the discussion of existential concerns when interviewed about their illness experience.

Methods: 30 adult outpatients with PAH were recruited for a 20-60 minute phone interview about their illness experiences, which were transcribed. Using qualitative content analysis, we developed a coding system to identify different types of communication (e.g. disclosure, avoidance) about existential issues as they occurred over the course of the interview.

Results: Illustrative passages are presented in which participants responded to an uncomfortable existential or death-related issue, either by explore these feelings to the best of their abilities, or else avoiding discussing them further. Notable avoidance strategies included subtly shifting the subject matter being discussed toward more comfortable topics, or downplaying the importance of the concern that was raised. Avoidance strategies used varied in subtlety and effectiveness.

Conclusions / Implications: Existential concerns patients face when living with serious life-threatening illnesses can produce discomfort in the patients experiencing them. This discomfort is evident in the avoidance strategies displayed in the data, however some patients choose to discuss them. Research on discussing existential concerns may help clinicians and researchers to better communicate and intervene with patients about these issues.
### Purpose:
Assertive Community Treatment Team (ACTT) is an evidence-and community-based approach developed to help those with chronic severe mental disorders achieve successful community integration and optimal health. The goal of this study was to determine how well health status was being monitored and changes in emergency visits and hospitalizations before and after joining ACTT, and factors that may contribute to visits/admissions.

### Methods:
Patient health records were reviewed in this correlational retrospective study.

### Results:
Of 63 patients, 71% (45) were men and 29% (18) were women with average age 39.7yrs (SD=8.4); primary diagnosis schizophrenia (81%, 57), bipolar disorder (22%, 18), and/or schizoaffective disorder (20%, 16). Other psychiatric diagnoses included: depression (29%), anxiety (17%), substance abuse (29%), ADD/ADHD (7%), and OCD (4%).

The most common other health problems were: diabetes (9%), hypertension (4%), dyslipidemia (6%). A letter from the ACTT Psychiatrist to primary care providers was found for all patients; recommendations were made for physical examination, laboratory tests and ECG, as appropriate. Results were found for laboratory tests: hematology (98%), electrolytes (70%), lipid levels (70%), renal function (73%), thyroid (71%), substance abuse (54%). ECG reports were found for 31 (49%) patients; may reflect proportion of younger patients.

Average participation in ACTT for 4.3yrs (SD = 3.5), range 0.40 to 14.5yrs; 9 < 1yr. On average, first emergency visit to the local site was at 34.8yrs (SD = 9.5); first hospitalization at 36.8yrs (SD = 10.4).

Average of ER visits 2 years prior to/following joining ACTT remained approximately 0.50 visit/year; whereas inpatient stays dropped from 0.98 to 0.28 (t = 5.3, p < .05).

### Conclusions/Implications:
Primary Health Care Providers are monitoring patients’ ongoing health status in collaboration with ACTT. Primary reasons for emergency visit and hospitalizations were similar over time: hallucinations, paranoia, suicidal ideation, and destabilization. Further exploration to determine changes in abnormal results over time and how mental health was associated with visit/hospitalizations when primary reasons were physical health related or related to socio-economic factors is being undertaken. This has relevance for health care providers of persons with mental health disorders who support their independent living seeking strategies for reducing hospital use.
Purpose: This study aimed to identify differences in gray matter volume (GMV) in patients with medication-resistant depression referred for rTMS treatment, versus healthy controls (HC). We also sought to identify areas that change in GMV over the course of rTMS, to identify predictors and correlates of response and non-response to rTMS treatment.

Methods: Voxel-based morphometry (VBM) was employed for measuring subcortical GMV, and Freesurfer for cortical thickness and surface area measurements. We compared T1-weighted MRIs of HC with those of MDD patients prior to rTMS, to identify regions of interest (ROIs) with aberrant GMV. The GMV in these ROIs was then compared in a longitudinal fashion between pre- and post-rTMS MRI scans in each patient, and VBM correlates of treatment response were identified.

Results: MDD patients had reduced baseline GMV in bilateral anterior insula, subgenual cingulate, posterior cingulate cortex and the right parietal lobule. Interestingly, the longitudinal analysis revealed a modest but significant reduction in GMV in anterior insula, right caudate and posterior cingulate cortex over rTMS treatment. Furthermore, within the ROIs identified by comparing pre-treatment MDD patients and HC, there was a correlation between greater symptom improvement and greater decrease in dorsomedial prefrontal and ventral posterior cingulate cortex GMV.

Conclusions/Implications: Significant differences in GMV were identified when comparing depressed and HC. The changes in GMV following rTMS were modest in absolute terms. Nevertheless, they did correlate with treatment response, identifying specific cortical regions as potential therapeutic targets and as potential biomarkers for predicting rTMS treatment response in future studies.
Purpose: Adults with schizophrenia report high frequency of medication non-adherence, which ranges between 40% and 50%. Medication non-adherence is associated with poor clinical outcomes, such as worsening of psychotic symptoms, higher rates of hospitalization and relapse. Pervasive cognitive deficits are a core feature of schizophrenia and lead to difficulties in various aspects of everyday functioning. Older adults experience greater cognitive dysfunction leading to increased difficulty with day-to-day activities, such as medication management. The purpose of this study is to examine the relationship between cognitive functioning and medication management and adherence in older adults with schizophrenia.

Methods: Cognitive function in adults aged 50 and above (n = 60; mean age = 63.60, SD = 6.82) diagnosed with schizophrenia was assessed using the MATRICS Consensus Cognitive Battery (MCCB). Medication adherence was measured using the Medication Management Ability Assessment (MMAA), which is a validated functional laboratory-based task with a delayed-recall component. Linear regression models were applied to determine significant cognitive predictors of medication management.

Results: The Working Memory, Sustained Attention and Reasoning and Problem-Solving domains of the MCCB significantly predicted performance on the MMAA, such that higher scores on all three cognitive domains predicted better performance on the MMAA (p’s < .05).

Conclusions/Implications: Those with lower functioning in frontal lobes are more likely to be non-adherent to their medication regimen. Early identification of impairment in cognitive function could allow for improved interventions to promote medication adherence in older adults with schizophrenia, thus improving clinical outcomes and quality of life.
**Abstract Title**
Association between Subjective Memory and Attention towards Threat in Cognitively Normal Older Adults

**Co-Author**
Namita Patel, Baycrest Health Sciences; Kimberley Yuen, Baycrest Health Sciences; Argie Gingoyon, Baycrest Health Sciences; Linda Mah, Baycrest Health Sciences, University of Toronto

**Purpose**
Subjective memory concern in older adults with normal cognitive performance is associated with increased risk of Alzheimer’s disease (AD) but the mechanisms underlying this relationship are unknown. Evidence suggests emotional dysregulation may occur in the earliest stages of AD. In the current study, we assessed the association between subjective memory and attention towards threat in cognitively normal older adults. Based on our hypothesis of emotional dysregulation as an early biomarker of AD, we predicted that subjective memory decline would be correlated with attentional bias towards threat.

**Methods**
Participants were 32 older adults (26 females, mean age = 72, SD = 6.7, mean MoCA = 26.7, SD = 1.9) with normal performance on neuropsychological assessment. Participants completed the Memory Functioning Questionnaire (MFQ) as a measure of subjective memory and a face rating task which required judging the width of faces with threatening or neutral expressions. Attention towards threat or “threat bias” was operationalized as longer response latencies to rate the width of threatening, relative to neutral, faces.

**Results**
Report of mnemonic use (MU) on the MFQ was significantly correlated with threat bias ($r = .50, p = .004$) and with reduction of threat bias over time ($r = .45, p = .009$). No associations between threat bias and objective memory performance or other MFQ measures were detected.

**Conclusions**
These findings are consistent with previous studies showing a relationship between emotional dysregulation and use of mnemonic strategies in older adults. Future work is needed to clarify the direction of this association.
Purpose: Nicaraguan youth face significant mental health problems, however the availability of services is lacking. School-based interventions are considered a sustainable solution to mental health service gaps in low- and middle- income countries (LMICs), but little qualitative research has focused on the role of teachers. The current poster presentation explores the extent to which teachers act as gatekeepers to mental health services, the specific barriers they face, and how this process can be improved, among teachers in Leon, Nicaragua.

Methods: Focus groups with teachers from four secondary institutions servicing youth aged 15-24 were held as part of a 2-year school-based mental health literacy project implemented in Leon, Nicaragua. Transcripts were analyzed using NVivo 11 and coded using the qualitative thematic analysis approach.

Results: Teachers acknowledged their role in providing guidance and advice to youth with mental health problems, but also noted barriers to supporting youth in accessing services, including lack of knowledge, training, institutional support, coordinated care pathways, mental health professionals in schools and available services.

Conclusions/Implications: The majority of teachers agree that schools should be involved in the mental health of students, however feel that they do not possess the necessary skillset. Appropriate mental health support in Nicaraguan schools requires both training for teachers to respond to help-seeking behaviors and the availability of mental health services for youth. To improve the services available for youth, next steps include increased training and awareness for teachers in conjunction with systematic integration and collaboration of services.
Purpose: Clinicians treat schizophrenia as one illness; however, a new paradigm suggests schizophrenia should be sub-typed according to treatment response. Although antipsychotics are the primary treatment for patients with schizophrenia, 20-30% of patients are resistant to this dopaminergic blockade and remain severely ill. This subset is considered to have treatment-resistant schizophrenia (TRS), a distinct clinical and biological entity of the illness. Some patients with TRS respond only to clozapine; others exhibit ultra-resistance (UR), characterized by non-responsiveness to all compounds. This study investigates clozapine-users to determine onset of TRS (i.e. from illness outset or developed over time) and rates of response to clozapine.

Methods: Our retrospective database review includes 106 first-episode schizophrenia spectrum patients that were treated based on an algorithm and failed two non-clozapine trials at CAMH from 2004 to 2015. TRS sub-types (i.e. illness outset, developed) were separated using clinical response to antipsychotic trials, and response trajectories to clozapine will be determined. Clinical and demographic risk factors at first contact for psychosis will be explored as predictors of 1) remission or 2) emergence of UR.

Results: Prevalence of TRS from the outset, developed TRS, and patients that exhibit UR, will be presented. Descriptive statistics will be reported to describe trajectories of response and risk factors.

Conclusions/Implications: Early identification of TRS is critical for optimizing treatment and improving long-term treatment outcomes. Differences in response to clozapine between TRS sub-types would necessitate tailoring the clinical treatment of patients with TRS to mode of development.
Purpose: Bipolar Disorder (BD) is among the most familial psychiatric disorders; early-onset type is thought to be the most heritable variant. BD is likely caused in part by multiple genes, each of small effect. We created a multi-gene risk score (MGRS) from 35 SNPs related to psychiatric diseases and related systemic processes. We then examined the association of MGRS with MRI measures in adolescents with BD.

Methods: MGRS was calculated from a sample of 114 BD and 101 healthy control (HC) Caucasian adolescents. Multiple MGRS were calculated by their allelic p-value association to BD. 70 (N = 33 BD, 37 HC) participants underwent 3-Tesla MRI T1-weighted structural scans. Hierarchical regressions were conducted to examine if effects of MGRS on ROIs were moderated by diagnosis.

Results: MGRS of SNPs with BD allelic association p ≤ 0.80 yielded good classification of BD vs. HC: \( t(213) = -4.655, p < .001, d = .638, R^2 = .123 \). At the allelic association p ≤ 0.80 level, increasing MGRS was associated with increased vIPFC volume (\( \beta = .351, p = .007 \)) and vIPFC area (\( \beta = .295, p = .023 \)).

Conclusion: There was a diagnosis x MGRS interaction effect on vIPFC volume and area, an area involved in emotional processing, emotional regulation, and reward response. SNPs involved in inflammation and vascular function were some of the highest associations with our BD sample providing evidence to support their inclusion in future genetic risk studies.
Investigating the diagnosis of depression and associated patient factors in the Sri Lankan primary care context

Yezarni Wynn, University of Toronto Faculty of Medicine; Arun Ravindran, Centre for Addictions & Mental Health, University of Toronto; Shehan Williams, University of Kelaniya

Introduction: Primary health services are often the first point-of-contact for patients with mental illness to have with the healthcare system. Many tools have been developed to increase detection of depression within primary care. However, utilizing these tools within the limited consultation timeframe has posed a challenge. Therefore, short questionnaires that effectively screen for depression that may be beneficial in improving the detection of depression in primary care.

Purpose: To develop and determine the sensitivity and specificity of a culturally validated 2-Question Questionnaire (2-QQ) to screen for depression in a suburban primary care clinic in Ragama, Sri Lanka.

Methods: A two-step cross-sectional study involving 1) verbal administration of 2-QQ to patients by their primary care physician; 2) completion of a validated diagnostic tool for depression (PDS) by the patients themselves. The results from the PDS were correlated to results from the 2-QQ to determine sensitivity and specificity of the 2-QQ.

Results: A score of 1/+ on the 2-QQ was most sensitive but least specific thus being effective for correctly identifying depressed patients, but also inaccurately capturing patients who are not depressed. A score of 6 on the 2-QQ was most specific but least sensitive. Setting the threshold at this level is effective for identifying patients without depression.

Conclusions: In the context of primary care, it may be worthwhile setting the 2-QQ screen at a lower threshold (a score of 1+/+) in order to capture more patients with depression and work them up for further evaluation.
Purpose: Reading disability (RD) is the most common neurodevelopmental disorder affecting children in North America. Although RD is known to be a complex genetic trait, associated genes largely remain unknown and unreplicated. We sought to identify genetic variants associated with reading by performing genome wide association (GWA) analyses on 5253 individuals from two samples.

Methods: The primary sample is a family-based RD selected sample from Toronto and the secondary is a population-based unselected sample named the Philadelphia Neurodevelopmental Cohort (PNC). Samples were previously measured for word reading ability and genotyped. We performed quality control analysis, imputation and association analyses. We hypothesized the majority of our top associated SNPs would be in novel genes or genes associated with RD related comorbidities.

Results and future directions: top associated SNPs from Toronto and PNC samples were found in genes (NRCAM, BIN1, KANSL2, and CCNT1) that are associated with other neurodevelopmental disorders/transcriptional processes. These SNPs are located in enhancer regions. Enhancers modulate transcription in a cell-type specific manner. We further hypothesize that RD associated SNPs may alter enhancer function leading to altered gene expression. We are testing top associated SNPs’ effect on enhancer function in neural precursor cells using a luciferase reporter assay. We also found a variant (rs2071267) in BIN1 which is predicted to be a splice site. We are testing for alternatively spliced isoforms associated with this variant in our RD samples.

Conclusion: This will contribute to a better functional understanding of variants associated with RD as well as associated neurodevelopmental disorders.
Purpose: Childhood Disruptive Behaviour (DB) is among the most common reasons for referral to mental health services, and parent training is a key aspect of evidence-based interventions. However, a growing body of research describes the association between parental variables, including readiness to engage in treatment and mental health difficulties, on the severity of children’s DB and parent participation in intervention. Developing a better understanding of how these key parental variables interact, and their association with severity of children’s DB, is necessary to identify targets for assessment and intervention.

Methods: The present study has two objectives: First, drawing on the Transtheoretical Model of Change we will determine whether parental readiness for change, among 178 parents of clinic-referred children with DB, is associated with parents’ self-reported mood and anxiety and the severity of their children’s behaviours. Second, we will determine whether parent internalizing difficulties moderate the relationship between readiness for change and severity of children’s DB. Based on previous literature, and work conducted in our lab, we hypothesize that greater parental readiness will be associated with higher levels of child DB, and that parent internalizing difficulties will moderate this relationship, such that in children with higher levels of DB, parents reporting higher levels of internalizing difficulties will report lower readiness for change.

Results: Data will be analyzed using SPSS V24, and moderation analyses will be computed using the PROCESSmacro.

Implications: Results from this study will inform targets for treatment innovation to potentially enhance outcomes for children with DB.
Background: MC4R is highly expressed in the hypothalamus where it controls feeding behavior. MC4R plays an important role in the regulation of meal size, but not meal frequency. Rs17066842, located in MC4R promoter region, is the most significant MC4R genetic variants associated with type 2 diabetes.

Methods: 1. Plasmids constructs using a firefly luciferase reporter vector; 2. Luciferase reporter assay; 3. Real-Time PCR; 4. RNA interference; 5. Electrophoretic mobility shift assay (EMSA);

Results: In this study, we identified rs17066842 is regulated by high glucose. High glucose treatment significantly reduced MC4R mRNA expression. An immediate early gene, EGR-1 (early growth-response gene 1), was discovered to reduce luciferase activity containing the MC4R promoter sequence with risk allele G of rs17066842. Knockdown of EGR-1 by siRNA disinhibited the transcriptional activity, leading to an increased MC4R mRNA level. Using electrophoretic mobility shift assays, we have shown that the probe with major allele of rs17066842 was able to compete with a well-known EGR-1 consensus sequence for EGR-1 binding. However, the minor allele of rs17066842 abolished this interaction, causing an enhanced transcription signal.

Conclusion: Our data implicated increased blood glucose normally produced after meal initiation might play an important role in the appetite regulation by the inhibition of MC4R, causing an extended meal duration, which might underline the molecular foundation that the risk allele of rs17066842 is highly associated with obesity and diabetes. Furthermore, in diabetes patients, persistent high blood glucose level might be the reason of increased appetites, as suggested in this paper.
## Rahmani, Noreen

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<tr>
<td>Co-Authors</td>
<td>Melanie R. Naiberg, PhD, Sunnybrook Health Sciences Centre, University of Toronto; Jessica Hatch, PhD, Sunnybrook Health Sciences Centre, University of Toronto; Lisa Fiksenbaum, PhD, Sunnybrook Health Sciences Centre; Daniel Dickstein, MD, Pediatric Mood, Imaging and NeuroDevelopment Program, The Warren Alpert Medical School of Brown University; Ana Andreazza, PhD, Centre for Addiction and Mental Health, University of Toronto; Christopher R. Bowie, PhD, Queen’s University; Benjamin I. Goldstein, MD, PhD, Sunnybrook Health Sciences Centre, University of Toronto</td>
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### Full Abstract

**Introduction:** Peripheral inflammatory markers are elevated among adolescents and adults with bipolar disorder (BD), particularly during symptomatic episodes. In adults with BD, inflammatory markers are negatively associated with neurocognitive functioning. This relationship has not been investigated in BD adolescents.

**Methods:** Participants were 13-20 years old, 63 with BD (31 symptomatic hypomania and/or depression, 32 euthymic) and 60 HC. Diagnoses were confirmed using the K-SADS semi-structured interview. Serum levels of three pro-inflammatory markers (interleukin (IL)-1B, IL-6, and tumor necrosis factor) and an anti-inflammatory marker (IL-10) were measured using commercial ELISA kits. Neurocognitive flexibility was assessed via the CANTAB intra/extradimensional shift (IED) task. Multivariate linear regression controlled for IQ and lifetime ADHD.

**Results:** IL-1b, IL-6, TNF and IL-10 protein concentration levels did not differ by diagnosis. Significant interactions were observed: within symptomatic BD adolescents, but not asymptomatic BD or HC adolescents, lower IL-1B/IL-10 ratio was significantly associated with more errors prior to the extra-dimensional shift (p=0.023). Similarly, among symptomatic BD adolescents, but not asymptomatic BD or HC adolescents, lower IL6/IL10 ratio was associated with significantly more trials to complete the IED task (p=0.012). The models accounted for 13.8% and 13.5% of variance in neurocognitive flexibility, respectively.

**Conclusion:** Anti-inflammatory predominance was unexpectedly associated with better neurocognitive flexibility among symptomatic BD adolescents, but not among euthymic adolescents or HCs. Prospective, repeated measure studies are warranted to verify the direction of these findings.
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<td>Co-Authors</td>
<td>Jenessa Johnston, York University; Carla Zucchero Sarracini, Sunnybrook Health Sciences Centre; Holly Tuokko, University of Victoria; Nathan Hermann, University of Toronto, Sunnybrook Health Sciences Centre; Damien Gallagher, University of Toronto, Sunnybrook Health Sciences Centre; Benoit Mulsant, University of Toronto, Centre for Addiction and Mental Health; Tarek Rajji, University of Toronto, Centre for Addiction and Mental Health; Linda Mah, University of Toronto, Baycrest Centre for Geriatric Care; Corinne Fischer, St. Michael's Hospital; Alastair Flint, University of Toronto, University Health Network; Bruce Pollock, University of Toronto, Centre for Addiction and Mental Health; Anita Myers, University of Waterloo</td>
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| Full Abstract               | Purpose: Mild cognitive impairment (MCI) and major depressive disorder (MDD) are significant risk factors for dementia and create unique problems for driving safety. This study examines the impact of these diagnoses in comparison to a healthy population on self-reported driving behaviours and attitudes among older adults. Methods: The Situational Driving Frequency, Situational Driving Avoidance, Driving Comfort (day and night), Perceived Driving Ability, and the Decisional Balance Plus scales were administered to participants with MCI (n=58), MDD in remission (n=38) or both (n=16) enrolled in a study of dementia prevention (“PACT-MD”) and in a healthy population of older drivers (n=928) from a longitudinal driving study (“Candrive”). Baseline data from both studies were stratified by gender and compared. Results: Females showed the largest differences between groups, with clinical samples reporting less driving frequency (d=1.59, p=0.013), more situations avoided (d=1.60, p=0.013), worse perceived abilities (d=1.89, p=0.003), and greater discomfort driving at night (d=1.50, p=0.010). The male clinical sample reported less comfort during both day (d=1.09, p=0.004) and night (d=0.96, p=0.004). PACT-MD-enrolled females had fewer positive beliefs surrounding driving for themselves (d=0.73, p<0.001) and others (d=0.62, p=0.001), and more negative beliefs about driving for themselves (d=1.33, p<0.001). PACT-MD-enrolled males reported more negative beliefs about driving for themselves (d=1.07, p<0.001). Conclusions/Implications: The disparity in results suggest that gender plays a role in subjective driving attitudes and behaviours and should be considered regarding the process of driving cessation in clinical samples. Self-awareness of driving ability and associated self-regulation can minimize potential risks to road safety.
Purpose: Depression occurs in ~25% of patients with cancer. Currently available antidepressants have limited effectiveness. Ketamine has been shown to be a well-tolerated, effective and rapid-acting antidepressant in the general population, however, has yet to be evaluated in patients with cancer. This study will assess the acute antidepressant effects of intranasal ketamine on depression in participants with cancer admitted to a palliative care unit. The feasibility and merit of a randomized, placebo-controlled trial (RCT) will be determined based on pilot efficacy testing, safety, tolerability and acceptability.

Methods: We propose a 14-day, open-label, phase II, single-armed clinical trial to assess the potential feasibility, efficacy and safety of intranasal ketamine for the treatment of depression in 20 participants with cancer receiving inpatient palliative care with an estimated life expectancy of less than 6 months and at least moderate severity depression [Montgomery-Åsberg Depression Rating Scale (MADRS) > 20]. Participants will be given an initial 50mg dose of intranasal ketamine on day 1, which may be further titrated to effect as tolerated on days 1, 4 and 7 to optimize clinical benefit. The primary outcome will be change in depressive symptom severity as measured by the MADRS on day 8. Results: Unavailable at time of submission.

Implications: The results from the proposed study will lay the foundation for a RCT of intranasal ketamine for depressed patients with cancer. If found to be effective, intranasal ketamine may improve the mental health and quality of life of depressed patients with cancer.
Purpose: The concept of social capital has been studied in epidemiological studies focusing on psychotic disorders. The purpose of this review is to map out the literature, synthesize findings and inform future research.

Methods: Three electronic databases were searched to identify relevant studies. Quantitative studies were included if social capital and psychosis or a psychotic disorder were the focus of the research. There was no limitation on date of publication.

Results: Of 145 eligible studies, 12 studies met the inclusion criteria. 8 studies measured social capital at the ecological level. 8 studies focused on risk and incidence of psychotic disorders or symptoms of psychosis. 2 studies focused on course of illness, 1 study focused both risk and course, and 1 study focused on a community based intervention. A variety of social capital measures were used including scales, surveys, and census measures. Lower levels on some measures of social capital were associated with a higher incidence. Higher levels of ecological social capital was associated with greater service use, however not with recovery or duration of untreated illness.

Conclusions/Implications: Prior literature has examined the impact of social capital on the incidence, course of illness, and interventions among people with psychotic disorders. A clear association between social capital and incidence of psychotic disorders is not supported by the literature. Heterogeneous measures of social capital make comparison between studies challenging. Further specification is required for meaningful study of social capital and its association with psychotic disorders.
### Full Abstract

**Purpose:** Agitation is a prevalent, difficult-to-treat symptom of Alzheimer’s disease (AD). Identifying a safe and effective treatment is a clinical and research priority. Cannabinoids have been shown to have psychotropic, anti-oxidant and anti-inflammatory effects. This may be important as evidence suggests agitation may be associated with neuroinflammation. We will investigate the association between markers of oxidative stress (OS) and neuroinflammation, with agitation, and whether they predict treatment response to the synthetic cannabinoid nabilone, in agitated patients with moderate-to-severe AD.

**Methods:** Serum markers of OS and inflammation, were collected from moderate-to-severe AD patients who were participants in a 14-week, double-blind cross-over trial comparing 6 weeks of nabilone to placebo with a 1-week washout between phases. Samples were collected at the start and end of each phase. The objectives are to investigate: 1) the relationship between OS and inflammation with agitation (Cohen Mansfield Agitation Inventory (CMAI)), at baseline; 2) the relationship between baseline levels of OS and inflammation with changes in agitation; 3) the longitudinal association between changes in OS and inflammation with changes in agitation.

**Results:** Thirty-nine patients were randomized (mean±SD age = 86.7±10, 77% male, CMAI = 67.9±17.6, Neuropsychiatric Inventory = 34.3±15.8, Mini-Mental Status Exam = 6.3±6.3). Samples were batched for analysis, and results will be presented at Harvey Stancer 2018.

**Conclusions/implications:** Cannabinoids have a distinct pharmacological profile that may offer an alternative approach to treat agitation, with potential benefits for OS and neuroinflammation. As there are no validated biomarkers of agitation, identifying a marker of agitation would assist in identifying patients who may benefit from treatment with nabilone, and monitor their treatment response.
Should Self-Report Questionnaires be included in the Suicide Risk Assessment? Compared Analysis of the Columbia – Suicide Severity Rating Scale and the Beck Scale for Suicidal Ideation in Psychoses

Vincenzo De Luca, Centre for Addiction & Mental Health; Sauliha Alli, Centre for Addiction & Mental Health

Background: Since early on in its development, the Columbia—Suicide Severity Rating Scale (C-SSRS) has been recognized as the gold standard for the assessment of suicidal ideation and behavior within most experimental and clinical trials. It’s validity in assessing both the number of suicide attempts and the severity of each is what has earned it this title. However, criticism of this widely used psychometric tool has accumulated over the years. Therefore, this study aims to investigate both the validity and reliability of the C-SSRS, in comparison to the Beck Scale for Suicidal Ideation (BSS).

Methods: 243 subjects were included in this study. Participants were both male and female, aged 18-75, with a current diagnosis of either Schizophrenia, Schizoaffective, or other Psychotic Disorders. For each subject, the Suicidal Behavior section of the C-SSRS was administered by a trained research personnel in an interview-based setting, followed by completion of a self-report version of the BSS. After each visit, CAMH medical charts were reviewed to record the history of actual suicide attempts.

Results: The occurrence of a suicide attempt and the number of past attempts was reported more accurately in the interview-based C-SSRS, compared to the self-report BSS questionnaire.

Conclusion: This evidence indicates that, compared to the BSS, the Columbia is in fact the more effective and accurate tool in assessing suicidal behavior within a population of psychotic patients. Despite the need of proper training to administer it, the many benefits that this scale offers, in comparison to other similar psychometric tools, validates its title as the gold standard for assessing suicide risk.
Full Abstract

Purpose: Genetics play a substantial role in schizophrenia etiology, although few studies have been able to alleviate the uncertainty regarding which factors confer increased risk of the disorder and aggravate the clinically relevant phenotypes. A prior pilot study we conducted aimed to remedy this by testing the association between antipsychotic dosages at the genome wide level. Currently, we have replicated this investigation and expanded our sample size with the goal of substantiating our findings, and further understanding the influence of genetics on optimal antipsychotic dosage.

Methods: 224 subjects with schizophrenia spectrum disorders were recruited from the Centre for Addiction and Mental Health outpatient programs. Antipsychotic dosages were collected through self-report and corroborated through medical chart review. Dosages were standardized using chlorpromazine equivalents (CPZe) and defined daily dose (DDD). Blood or saliva samples were collected and genotyped using the Illumina HumanOmnio2.5-8 BeadChipKit. Genetic markers were analyzed for significance using linear regression, and graphically visualized using Manhattan plots. Results: The results of this pilot study will help to further elucidate the role of a patient’s genotype in their optimal antipsychotic dosage. Looking at antipsychotic dosage as a clinically relevant phenotype is a novel perspective in schizophrenia research that, to the best of our knowledge, has not been pursued outside of our lab.

Implications: In the future, a deeper understanding of this relationship will assist clinicians in assessing patient risk for more severe schizophrenia, and may even improve the ability of physicians to prescribe optimal antipsychotic dosages with greater certainty and efficiency.
**Full Abstract**

Purpose: Obesity is up to 4 times higher in schizophrenia than in the general population, with a prevalence of about 50%. Given the unclear link between obesity and schizophrenia in the absence of antipsychotic use, we aimed to compare obesity measures (i.e. body mass index (BMI), waist circumference (WC), and waist-to-hip ratio (WHR)) between antipsychotic-naive patients with psychosis and healthy controls (HCs).

Methods: A systematic search was conducted through Ovid Medline®, PsycINFO, and EMBASE. Standardized mean differences (SMDs) in obesity measures between groups were calculated. Three separate sensitivity analyses were performed to examine the effects of: (1) age, sex, and ethnicity; (2) minimal antipsychotic exposure (i.e. \( \leq 2 \) weeks); and (3) non-schizophrenia-related affective psychosis. The influences of patients’ age and %male on SMDs were assessed through meta-regression.

Results: A total of 14 studies were included: BMI \((n = 14)\), WC \((n = 6)\), and WHR \((n = 4)\). In the main analyses, BMI was lower and WHR was elevated in patients compared to HCs. These differences remained in patients matched with HCs for age, sex, and ethnicity, in those who had never taken antipsychotics, and in patients with schizophrenia spectrum disorders. Patients’ age was negatively associated with SMDs in BMI, and the higher proportion of males in the patient group was related to higher SMDs in BMI.

Conclusions: Differences in obesity measures were observed between antipsychotic-naive patients with psychosis and HCs. An improved understanding of these weight alternations may guide strategies for monitoring weight gain in patients with schizophrenia.
**Full Abstract**

**Purpose:** Agitation and aggression affect more than 80% of patients with Alzheimer’s disease (AD). Concerns have been raised about underutilization of behavioral interventions and inappropriate psychotropic use which may be associated with adverse effects. To address these issues, we designed and implemented an Integrated Care Pathway (ICP) at a geriatric psychiatry inpatient unit at CAMH. After its successful implementation, we adapted and implemented this ICP as a pilot in a long-term care facility.

**Methods:** Patients diagnosed with Dementia of AD or mixed AD+ vascular type with clinically significant agitation were enrolled. Impact of the ICP was assessed using Cohen Mansfield Agitation Inventory – Frequency (CMAI-F) and Neuropsychiatric Inventory Questionnaire (NPI-Q).

**Results:** We enrolled 18 patients (Mean = 87.8, SD = 6.1) of which 15 patients have completed the study so far. There was a significant improvement in agitation as shown by mean CMAI-F score from 50.3 (SD = 15.4) at baseline to 43.1 (SD = 9.8) at exit (t = 2.2, p = 0.02, Cohen’s d = 0.56). There was also a significant improvement in neuropsychiatric symptoms as shown by mean (SD) NPI-Q distress scores at ICP entry = 10.62 (SD = 7.9) and at exit = 5.54 (SD = 3.68) (t= 2.57, p = 0.024, df = 12). There was 0% polypharmacy. Further data will be presented at the conference.

**Conclusions/Implications:** Algorithmic approach to treat agitation and aggression associated with AD is feasible in a long-term care setting. Our findings also suggest that it is efficacious in treating these symptoms.
Background: Inhalational asphyxia suicide has been a global interest due to the rapid emergence of novel methods in Asia and Europe. These methods are important because they may be amenable to means restriction strategies which may reduce suicide rates. Deaths by these methods have not been studied in Canada.

Purpose: To determine the characteristics associated with inhalational asphyxia suicide in Toronto.

Methods: We reviewed charts of suicides at the Office of the Chief Coroner of Ontario for the city of Toronto (1998 - 2015). Deaths were categorized as due to inhalational asphyxia by a) compressed gas (e.g. helium), b) charcoal burning, or c) car exhaust, or by methods other than non-inhalational asphyxia. Demographic, clinical and suicide specific differences between decedents in these categories were compared using a chi-squared or ANOVA global test of significance with additional pairwise comparisons where appropriate.

Results: Inhalational deaths accounted for 190 (4.7%) of all suicides in Toronto (n = 4062) over the study period. Deaths by compressed gases increased over 6-year increased from 6 (1998-2003) to 26 (2004-2009) to 46 (2010-2015), and these deaths were more likely to be accompanied by the “Final Exit” book (15% vs. 0.7%, p <0.0001). Those who died by inhalational asphyxia were more likely to be male (84% vs. 70%, p <0.05). Those who died by compressed gas and charcoal burning were more likely to leave a suicide note (68% vs. 30%, p <0.0001).

Discussion: Suicide by inhalational asphyxia, particularly by compressed gases, have increased substantially in Toronto. Efforts to restrict access to these methods are warranted.
A preliminary study of heightened emotions in existential conversations with patients with pulmonary arterial hypertension

Adrienne Tan, University Health Network; Chris Lo, University Health Network

Rationale: Pulmonary Arterial Hypertension (PAH) is a progressive illness associated with increased mortality. The diagnosis of a life-limiting disease may raise existential concerns about the quality and meaning of one’s life, eliciting powerful feelings.

Objective: To examine the range of emotions that can emerge when discussing existential concerns affecting PAH patients’ sense of meaning in life.

Methods: 30 adult patients with PAH were recruited from outpatient clinics and participated in a semi-structured interview about their illness. Transcripts were examined for moments of heightened emotion and content analysis was used to categorize the expressed emotions. A correspondence analysis is underway to examine patterns in the co-occurrence of emotions and their association with existential themes.

Results: The sample was 77% females with a mean age of 52 years (SD = 18) and mean illness duration of 6.3 years (SD = 5.3). 10-13% of the sample had a history of depression or anxiety. Moments were associated with between 1-3 emotions. Emotions were placed into 6 distinct categories: negative emotions about the past (e.g. regret), the future (e.g. fear), about oneself (e.g. helplessness) or involving external events and people (e.g. anger), positive emotions (e.g. gratefulness) and static states (e.g. contentment). These emotions were analyzed in relation to existential themes associated with loss and disruptions to the sense of self and relationships.

Conclusion: By understanding the nature and multiplicity of emotions that arise during existential conversations, health care providers may be better able to explore and alleviate negative feelings, promoting adaptation to life-limiting illness.
Purpose: Premature termination of treatment is a serious problem in the treatment of eating disorders about which prior research has yielded mixed results. One proposed explanation for this is a failure to examine the time course of treatment termination. Thus, this study was designed to explore the potential effect of timing of treatment termination.

Methods: Participants were 125 eating disorder patients admitted voluntarily to the inpatient program at Toronto General Hospital between 2009 and 2014. At admission, all patients completed measures of eating disorder symptoms, eating disorder cognitions, depressive symptoms and emotional dysregulation. Body weight was measured weekly. Data analyses were completed using independent sample ANOVAs and Chi Square tests.

Results: Results showed significant relationships between timing of treatment termination and eating disorder diagnosis, severity of eating disorder cognitions and severity of depressive symptoms. A trend was found for laxative use and severity of emotional dysregulation. Post-hoc analyses revealed that patients who left treatment early were more likely to have the binge purge subtype of anorexia and had more severe depressive symptoms, eating disorder cognitions and difficulties with emotional dysregulation. Similarly, patients who terminated treatment later had more severe depressive symptoms and emotional dysregulation than patients who completed treatment.

Conclusions: Timing of premature termination of treatment matters. Patients who terminate inpatient treatment early in their admissions differ significantly from patients who terminate later and those who complete treatment. These findings have potential clinical implications for the clinical management of patients severe eating disorders requiring inpatient admission.
Purpose: Increased importance has been attached to the subjective perception and evaluation of clinical symptoms and treatment outcomes. The aim of this study was to compare the self-report and objective-rated versions of the Clinical Global Impression scale – Schizophrenia version (CGI-SCH) to explore the subjective perception of symptoms among the population of patients with chronic schizophrenia.

Methods: 93 participants diagnosed with schizophrenia or schizoaffective were recruited to complete the subject-version of CGI-SCH. Positive, negative, depressive, and cognitive symptoms were evaluated as well as overall severity of illness. Participants were instructed to report on a 7-point scale.

Results: Compared to raters using the same scale, participants rated their clinical symptoms to be significantly lower. At the same time, there was a positive correlation between participants and raters for all ratings, although the strength of correlation varied. For example, the correlation was highest for depressive symptoms. Of note, participants were consistent in their ratings between baseline and the last observation, while the raters rated participants’ cognitive symptoms as improved across visits. Age, gender and years of education did not impact the relationship between participant and rater scores.

Conclusions/Implications: The study suggests that the present findings support the use of self-report in clinical assessments of individuals with schizophrenia; however, they also suggest heterogeneity across symptom domains. To be specific, participants might be more insightful with regarding to some domains such as positive symptoms and depressive symptoms comparing to negative symptoms and cognitive symptoms.
**Abstract Title**

Involving Families with Lived Experience in Mental Health and/or Addiction Service Design and Implementation

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**Purpose:** The purpose of this study was to engage people with a youth with mental health and/or addiction (MHA) issue(s), to determine the nature of their experience in contributing to the design and implementation of the Family Navigation Project (FNP) as part of a Family Advisory Council (FAC).

**Methods:** Semi-structured interviews were conducted with past and present members of the FAC (n=8) to obtain a qualitative narrative of their experiences in the development of the FNP. Thematic analysis of transcribed interview data was conducted to identify themes.

**Results:** The experience of people with Lived Experience (LE) in the development of a MHA service can be summarised under 5 themes: 1) The contribution of FAC member’s motivation, 2) The necessity of FAC member engagement, 3) the need for development of group identity and culture, 4) the centrality of embedding LE in the service, and 5) the importance of validation from staff and other FAC members. Interest in MHA service design was motivated by past experiences, but a continued sense of engagement was driven by involvement in projects with clear outcomes, and a recognition of LE efforts. Despite experiencing a change in the role of LE as the MHA service grew, people with LE continued to believe in the importance of including the LE voice.

**Conclusions/Implications:** A commitment to perspectives of individuals with LE is needed at every level of the MHA system for meaningful LE engagement. These findings can guide the effective integration of LE into new and existing MHA services.
Purpose: To present initial exploratory analyses looking at the association between brain derived neurotrophic factor (BDNF) genotype and oxytocin receptor (OXTR) genotype and response to psychotherapy in patients with borderline personality disorder (BPD).

Methods: 68 female Caucasian patients with BPD were drawn from a randomized control trial of Dialectical Behavior Therapy vs General Psychiatric Management. DNA was extracted from saliva samples and BDNF genotype at rs6265 and OXTR genotype at rs53576 were determined. The outcome measures were suicide attempts and self-harm, BPD symptomology and symptom burden. Outcome measures were administered at baseline, post-treatment and 1 year post-treatment.

Results: Both OXTR and BDNF genotypes were in Hardy-Weinberg equilibrium. Patients with the less common GA/AA BDNF genotypes had similar outcomes post-treatment when compared to the more common GG genotype. However at 1-year post treatment the patients with GA/AA genotypes did better on all three outcome measures. No differences in outcome were seen between OXTR GG vs GA/AA genotypes.

Conclusions/Implications: Patients with the GA/AA BDNF genotype had a more robust response to treatment at 1 year. BDNF is involved in neurogenesis and learning and people with the GA/AA genotype have lower levels of BDNF than those with the GG genotype. It is unclear why the GA/AA genotype would be associated with improved treatment response at 1 year. Next steps include replication with a larger sample size. Identifying possible biomarkers associated with treatment response is important to inform the development of a personalized approach to treatment to enhance its effectiveness.
Purpose: Our purpose is to study the feasibility and efficacy of yoga as a manualized therapeutic modality for youth with symptoms of anxiety.

Methods: This study is a quasi-experimental trial involving 11 & 12-year-olds with self-reported symptoms of anxiety drawn from waitlists at SKCCMH. Participants were assessed at baseline and then introduced to the intervention, a manualized yoga group therapy called InCYT-Y (Integrative Cognitive Yoga Therapy for Youth). Feasibility will be measured for participants and the Centre. For participants, this is intended to be accessible and safe, and as such we would measure feasibility as attendance of at least 7 of 12 of the sessions by a minimum 50% of participants. We also anticipate no serious adverse events, defined as an event requiring intervention by a health care practitioner. For the Centre, feasibility would involve the modality requiring similar resources to other groups. As it is designed, the intervention currently meets this. Regarding secondary outcomes, we expect to find symptom improvement on all measures used. From the final qualitative interview, we would expect a subjective sense of improvement in function.

Results: The pilot is currently underway, with three sessions now completed. Attendance thus far has been 95.8%, with no adverse events reported. Subjectively, participants have cited improved relaxation. Conclusions/Implications: This study is not yet complete. A successful trial would increase the evidence supporting yoga as an intervention for youth. As it is a manualized approach, we intend to replicate the study, aggregating the data to improve the evidence base.
**Subramaniam, Ponnusamy**

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<tr>
<td>Co-Authors</td>
<td>Nicole Gough, Centre for Addiction &amp; Mental Health; Lea Brkan, Centre for Addiction &amp; Mental Health; Lina Chiuccariello, Centre for Addiction &amp; Mental Health; Tarek K. Rajji, Centre for Addiction &amp; Mental Health, University of Toronto</td>
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**Full Abstract**

**Purpose:** There is an increasing interest in administering both transcranial Direct Current Stimulation (tDCS) and cognitive remediation (CR) program remotely or at-home setting. This systematic review was aimed to examine the feasibility and details of intervention components to support the delivery of tDCS and CR remotely or at-home.

**Methods:** A systematic literature search was conducted in PubMed, Ovid Medline, PsychINFO and CIHAHL using relevant MeSH terms and keywords. All original reports that were published in English up to December 2017 were included. Exclusion criteria included studies with the majority of intervention conducted at research centers with very little at-home components.

**Results:** Fifteen tDCS and 21 CR studies were identified. Most of the studies still within preliminary or pilot study levels with very few studies have been employed RCT to evaluate the effectiveness of at-home tDCS or/and CR intervention. Meanwhile very few studies have been combined with both tDCS and CR as an intervention at-home. The primary finding from the literature suggest that with appropriate training and family involvement, tDCS and CR at-home is possible with available information and communication technology (ICT), such as , monitoring, consultation and further support.

**Conclusions:** The feasibility to deliver tDCS or/and CR remotely begins to establish for some medical conditions with ICT support.
Purpose: Little is known regarding the association of cannabis use with brain structure in adolescents with bipolar disorder (BD). Therefore, we set out to examine this topic in a well-characterized sample of adolescents with BD and healthy control (HC) adolescents.

Methods: Participants included 114 adolescents (n=54 BD, n=60 HC), ages 14-20 years; of these, 37 participants (n=29 BD, n=8 HC) reported lifetime use of cannabis. FreeSurfer-processed T1-weighted images, based on 3T MRI, yielded measures of cortical thickness, surface area (SA), and volume. Vertex-wise analyses complemented region of interest (ROI; amygdala, hippocampus, ventro-lateral prefrontal cortex (vLPFC), ventro-medial prefrontal cortex (vmPFC), and anterior cingulate cortex (ACC)) analyses. General linear models (GLM) covaried for age and sex. For volume and SA analyses only, intracranial volume was added as an additional covariate.

Results: ROI analysis revealed a significant diagnosis x cannabis interaction such that cannabis use was associated with greater reduction in vLPFC SA (F=6.333, p=0.013) in BD versus HC. Vertex wise analysis revealed a significant diagnosis x cannabis interaction such that cannabis use was associated with greater reduction in pars orbitalis (F=12.055, p=0.001) and rostral middle frontal (F=10.457, p=0.002) SA, middle temporal volume (F=20.279, p<0.001), and banks of superior temporal sulcus thickness (bankssts) (F=17.397, p<0.001) in BD versus HC.

Conclusion: Preliminary cross-sectional, retrospective findings suggest that the association between cannabis use and brain MRI phenotypes is moderated by BD diagnosis. Further studies are necessary to determine the direction of the observed association, and whether these associations also relate to neurocognitive dysfunction and/or symptom burden.
Purpose: Investigate differences in cognitive task-induced cortical DA release between healthy controls (HC) and participants at clinical-high risk (CHR) state for schizophrenia (SCZ) using Positron Emission Tomography (PET) imaging with [11 C]-FLB-457 radiotracer.

Methods: 14 anti-psychotic naïve CHR were recruited from the Focus on Youth Psychosis Prevention clinic at CAMH and 15 HC were recruited from the community. CHR diagnosis and symptom severity was confirmed by an active psychiatrist and Structured Interview for Prodromal Symptoms, respectively. HC had no current or past DSM-IV Axis I diagnosis and no family history of psychotic disorders. The Repeatable Battery for the Assessment of Neuropsychological Status and Wisconsin Card Sorting Task (WCST) was administered to assess cognitive abilities. All participants underwent two PET scans using a high-resolution PET-CT during which they performed 6 trials of the Control Task and the WCST. Cortical DA release was quantified as the radiotracer displacement (ΔBPND) between scans in the prefrontal cortex (PFC) and subregions. Each participant also completed an MRI scan for anatomical delineation. Analysis of covariance was used for statistical analysis. Results: No significant difference in radiotracer ΔBPND in PFC and subregions and cognitive performance between groups.

Conclusions/Implications: This is the first in vivo study exploring cognitive task induced cortical DA activity in prodromal SCZ. However, we report no significant differences in cortical DA release between groups. An expanded sample is required to better understand cortical DA activity in SCZ and further guide us in identifying biological risk factors and preventative treatment measures.
### Full Abstract

**Background:** Obsessive-compulsive disorder (OCD) is a debilitating disorder characterized by obsessive thoughts and compulsive behaviours that affects up to 3% of the population. More than 50% of affected adults report symptom onset during childhood. Changes in cortical-striato-thalamo-cortical (CSTC) network activity are hypothesized to underlie illness symptoms, however, CSTC alterations in OCD imaging research are inconsistent. To date, few studies have been conducted in paediatric samples, where confounds such as duration of illness and medication effects may be absent. Moreover, few studies have taken a data-driven approach to examine neural network activity broadly in OCD.

**Methods:** Magnetoencephalography was acquired at rest in drug-naive children with OCD (n = 18) (M = 11.9 years ± 2.1; 10M/8F) and healthy control children (n = 14) (M = 12.3 years ± 2.6; 7M/7F). Between-group differences in whole-brain resting-state functional connectivity was examined through weighted phase lag (WPLI, using the fieldtrip toolbox). The Network Based Statistic graphical analysis was used to examine connectivity while controlling for multiple comparisons. **Results:** On comparison of OCD to controls, lower alpha activity between the right fusiform area and orbito-frontal cortex was found in OCD while an increase in theta activity between the right putamen, left calcarine sulcus, and vermal regions was found in the OCD group compared to controls.

**Conclusions:** Our preliminary findings in a small sample of children with OCD indicate that atypical frequency-specific, network-level communication may be present in paediatric OCD and contribute to accumulating evidence that visual and cerebellum networks outside of CSTC may be affected.
Purpose: Residential treatment programs benefit individuals with severe, treatment refractory obsessive-compulsive disorder (OCD). Sunnybrook Health Sciences Centre recently launched the first Canadian residential OCD treatment program, using evidence-based interventions with a focus on cognitive behavioural therapy. This paper will present preliminary outcomes.

Methods: Treatment refectory patients (n=9) experiencing persistent, severe OCD symptoms were provided questionnaires at baseline and discharge, including: the Yale Brown Obsessive Compulsive Scale (Y-BOCS), Obsessive Compulsive Inventory-Revised (OCI-R), Quality of Life Enjoyment and Satisfaction Questionnaire – Short Form (QLES-SF), Distress Intolerance Index (DII), Brief Experiential Avoidance Questionnaire (BEAQ) and the Quick Inventory of Depressive Symptomatology (QIDS).

Results: Paired sample t-tests revealed significant reductions on the Y-BOCS from baseline (M = 31.6; SD = 6.1) to discharge (M = 16.7; SD = 4.9), p = .00 and on the OCI-R from baseline (M = 33.1; SD = 16.1) to discharge (M = 22.4; SD = 19.4), p = .022. The DII also significantly decreased from baseline (M = 25.1; SD = 6.1) to discharge (M = 18.9; SD = 5.2), p = .027 as did the BEAQ from baseline (M = 56.11; SD = 8.5) to discharge (M = 43.9; SD = 12.8). Finally, increases were seen on the QLES-SF from baseline (M = 42.2; SD = 11.7) to discharge (M = 60; SD = 11.5), p = .001. The QIDS did not significantly decrease, p=.078.

Conclusions: Results provide support for recovery from OCD within a new residential treatment program in Canada and highlights preliminary program feasibility and effectiveness.
Purpose: One in four individuals born with 22q11.2 deletion syndrome (22q11.2DS) develops schizophrenia. Current guidelines for 22q11.2DS recommend standard management for schizophrenia. However, there is a paucity of literature on the prescribing pattern of antipsychotic medications and comorbid metabolic illness in this patient population.

Methods: We investigated 97 adults with 22q11.2DS and primary psychotic disorder (schizophrenia or schizoaffective disorder) per DSM-V criteria. We utilized a cross-sectional data analysis and review of lifetime psychiatric records to determine antipsychotic usage, antipsychotic polypharmacy, anticholinergic medication use, and concurrent treatment of metabolic diseases.

Results: There were 89 (91.8%) individuals with a history of primary psychotic disorder and 22q11.2DS on antipsychotic medications. Of these, thirty-four (38.2%) were prescribed more than one antipsychotic. The prevalence of antipsychotic polypharmacy in this population was significantly higher than that reported in a large Canadian study of schizophrenia (p< 0.001). Individuals on two or more antipsychotics were significantly more likely to be prescribed anticholinergic medications (p= 0.03). There was concurrent prescription of antihyperglycemic medications in 10 (11.2%) patients and treatment of dyslipidemia in 8 (9.0%) patients. Individuals on an antihyperglycemic agent had significantly higher BMI (p< 0.001) than those not on these agents.

Conclusion: The current study sheds further light on the management of psychotic illness in this high-risk genetic population, including evidence for high rates of treatment-resistance and antipsychotic polypharmacy. The results emphasize the need for further data on the pathophysiology and treatment of psychotic illness in this genetic subtype of schizophrenia as we improve our ability to diagnose genetic conditions.
Full Abstract

Purpose: Canada recently launched its first residential treatment program for individuals with severe, treatment-refractory Obsessive-Compulsive Disorder (OCD). To better understand the impact of family involvement within this type of treatment model, we set out to gather patient perspectives of family interventions received within well-established U.S residential treatment programs for OCD.

Method: Semi-structured interviews were conducted with five individuals, all of whom had received treatment within a U.S. residential program. Interviews were audio-recorded, transcribed and coded to extract common themes.

Results: Three major themes emerged: (1) education; (2) family involvement; and (3) meaningful changes. Participants reported that including family members in treatment provided support, modulated the amount of distress experienced and improved family relationships by reducing family accommodation.

Conclusions/implications: This study obtained a rich patient narrative regarding strengths and weakness of family interventions within well-established U.S. treatment centres for OCD. Findings may assist program development within emerging residential treatment programs.
Purpose: Patients with schizophrenia have been shown to have an increased risk for physical aggression and violence, a public health concern affecting not only patients, but also their families, communities, and clinicians. While certain clinical features have been reported as risk factors, it has been difficult to integrate these factors to identify individuals with an elevated risk for physical aggression. The present study implements a machine learning algorithm to develop a clinically-relevant tool to predict occurrences of physical aggression in schizophrenia patients.

Methods: A cohort of 275 schizophrenia patients was assessed in a cross-sectional study. The presence and seriousness of lifetime physical aggression episodes were assessed from electronic medical records using severity scales similar to the Modified Overt Aggression Scale (MOAS). Utilizing sociocultural and clinical variables from other psychiatric scales, we developed a logistic regression machine learning algorithm with five-fold validation using the ‘CARET’ package in R to predict episodes of physical aggression.

Results: In this sample, there were 103 subjects with instances of physical aggression and 172 subjects without physical aggression. The CARET analysis generated a model to predict for physical violence, which demonstrated an overall accuracy of 67% and an area under the curve (AUC) of 0.63. The prediction was statistically significant (p<0.0001) when compared against a random prediction.

Conclusions: Machine learning algorithms are becoming increasingly valuable, utilizing statistical techniques to develop an effective computational model to determine outcomes based on variables. Optimization of this model would allow for early interventional measures to prevent episodes of physical aggression.
## Full Abstract

**Purpose:** Psychedelics, including (+)-lysergic acid diethylamide (LSD) and psilocybin, share 5HT2A agonist properties and are currently experiencing a resurgence in scientific interest. However, there remains no research into the popular phenomenon of ‘microdosing’ psychedelics. Anecdotal reports suggest that microdosing psychedelics may confer some benefits, including improvement in cognitive performance. Rigorous scientific inquiry into this practice is necessary to establish its safety and potential benefits.

**Methods:** We conducted an anonymous, online survey that included questions pertaining to microdosing habits (substance, frequency, dosage), comorbid illicit substance use, psychiatric history, prescription medications, and subjective lifestyle improvements attributed to microdosing. The survey was open to current and past microdopers, as well as individuals with no interest in microdosing. Ethical approval was received from the University of Toronto Social Sciences, Humanities, and Education Research Ethics Board. This study provides an exploratory analysis; testing of pre-registered hypotheses was conducted in a companion report.

**Results:** A total of 909 participants responded to the survey. LSD and psilocybin were the most commonly-reported substances used. Notable preliminary results include a high prevalence of ADHD (34.1% of microdopers), and 51% of past microdopers who decreased their caffeine use because of microdosing. There was significant comorbid polysubstance use among all respondent groups.

**Conclusions/Implications:** This survey provides the first scientific exploratory investigation into the phenomenon of microdosing psychedelics through a psychiatric lens, including the demographics and practices of a sentinel population of microdopers. Novel findings from this survey can guide future research in the microdosing of psychedelics, the reported benefits of which require empirical validation.
Obsessive-Compulsive Disorder and Suicide: An Underexplored Phenomenon

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Background: Canadians with OCD are at a modestly increased risk for suicide with a 2% prevalence rate of suicide attempts. Most suicide research has focused on populations that account for the majority of deaths (mood, psychotic, substance, personality disorders) with suicide in OCD largely unexplored.

Purpose: To determine the clinical characteristics associated with suicidal ideation (SI)/attempts and death in people with OCD.

Methods: We reviewed charts of suicides at the Office of the Chief Coroner of Ontario for the city of Toronto (1998 - 2015) and charts for current patients with OCD at a large outpatient OCD specialty clinic. Clinical characteristics between groups were compared using descriptive and chi-square statistics.

Results: Thirty-two suicide decedents ages 12-77 (M= 47.3, SD= 16.8) had a history of OCD. Eighty-eight percent had a comorbid mood disorder and 31% had a substance use problem. Thirty-one percent had a history of multiple suicide attempts. Fall/jump from height was the most common suicide method (38%) followed by self-poisoning and hanging (22%). Forty-six percent of the 142 outpatient OCD sample ages 17-72 had lifetime SI and 16% made a prior suicide attempt, with self-poisoning most common. Correlates of SI/attempts were comorbid depression (p< 0.001), alcohol abuse/dependence (p= 0.002), and “bad” thoughts (p= 0.02).

Conclusions: Suicide research has focused on other clinical populations with suicide in OCD being largely unexplored. Multiple suicide attempts/SI, comorbid depression, and “bad” thoughts appear to be warning signs of suicide in those with OCD. Therefore, targeted suicide prevention strategies should account for these findings.
Purpose: The complement component 4 (C4) gene has previously been identified as one of the strongest genetic markers of schizophrenia (Sekar 2016). In this study, we aim to replicate these findings and further explore the relationship between C4 genetic variants and schizophrenia phenotypes.

Methods: 680 adults with schizophrenia or schizoaffective disorder were recruited from CAMH. Clinical and demographic information were gathered through structured clinical interviews and chart review. ABI TaqMan copy number variation (CNV) protocol was used to determine copy numbers of the A, B, long (L), and short (S) structural variants of C4. In addition, C4 CNV data on 89 controls were derived from the Sekar (2016) paper.

Results: Following Bonferroni correction, controls had significantly higher copy numbers of C4A compared to patients, whereas there was no difference in C4L CNV between groups. Among patients, there was no significant relationship between C4 CNV and any of the following: age of onset; illness duration; symptom severity; General Assessment of Function; and presence of symptoms such as delusions, hallucinations, disorganized speech or behaviour, catatonia, alogia, avolition, inappropriate affect, and affective flattening.

Conclusion & implications: Although Sekar (2016) previously identified C4AL as a risk allele for schizophrenia, we found mixed preliminary evidence on the link between C4A CNV and schizophrenia risk. Further, we found no evidence of relationship between C4 CNV and schizophrenia phenotypes. More detailed analyses involving C4 haplotype (as opposed to CNV) and neural C4A expression are needed to further clarify the role of C4 in schizophrenia risk and phenotypes.
Purpose: This study examined the impact of CBT on personality in participants with OCD and Related Disorders. Research has demonstrated that domains and facets of the ‘Big 5’ personality model reflect unique vulnerabilities in OCD compared to mood and anxiety disorders (Rector et al., 2002, 2005, 2012). While research has examined the impact of empirically-supported treatments on personality dimensions in mood and anxiety disorders (see Enns & Cox, 1997 for review), no published research has tested the impact of CBT on personality in OCD and Related Disorders, despite demonstrated personality vulnerability.

Method: Treatment-seeking participants (N=66) with a primary DSM-5 diagnosed OCD or Related Disorder, Trichotillomania, Skin Picking, and Hoarding Disorder, completed disorder-specific structured group CBT, symptom measures and the NEO-PI-R at baseline and post-treatment.

Results: Across all diagnostic groups, significant treatment effects were observed on the domains of Openness (t = -3.01, p = .004) and Agreeableness (t = -3.45, p = .001) but not on Neuroticism, Extraversion, or Conscientiousness. Examination of diagnostic group differences in change across domains demonstrated a significant OCD versus Related Disorders interaction, with greater reductions occurring in Neuroticism in OCD versus collapsed Related Disorders group, t = 2.17, p = .037. Further, change in Neuroticism scores from pre-post treatment in the OCD group was significantly associated with symptom change based on YBOCS change scores (β = .43, p = .026).

Conclusions/Implications: These preliminary findings suggest that CBT may produce changes in specific higher order domains of personality vulnerability known to confer risk for OCD and Related Disorders.
Abstract Title
The investigation of visual N1-P2 complex amplitude and latency differences between neurotic and non-neurotic individuals

Co-Authors
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Full Abstract
Purpose: Neuroticism has been previously linked to impaired attention and is correlated with psychiatric disorders with attention-related symptoms. Changes to ERPs have been observed in individuals assessed to be neurotic. Therefore the current study aims to investigate the visual N100 and P200 event-related potentials (ERPs) associated with attention using a 2-back working memory task in healthy neurotic and non-neurotic participants, evaluated using the NEO-FFI.

Methods: Thirty five healthy Canadian university students (mean age = 22.6, SD = 6.25; 21 male, 14 female) with normal or corrected-to-normal vision were recruited. Participants completed a NEO-FFI self-report and a 2-back working memory task. EEG recordings were analyzed and epoched to 700 ms (200 ms before and 500 ms after stimulus onset). N100 and P200 peak amplitude and latency, as well as 2-back performance were analyzed using ANOVA for between-subject groups (High Neuroticism, Low Neuroticism).

Results: Analysis of N100 and P200 amplitude and latencies in High Neuroticism and Low Neuroticism subjects showed an increased P200 amplitude for High Neuroticism subjects in the frontal-midline regions. Higher P200 latency was also observed in High Neuroticism subjects at the parietal region. However, there were no significant performance differences between the High and Low Neuroticism subjects for the 2-back task.

Conclusion: The increased amplitude and latency in the frontal-midline and parietal regions in High Neuroticism participants suggest a difference in directed visual attention between neurotic and non-neurotic individuals. Further investigation into participant reaction time and neuroticism is required.
An inter-professional educational initiative on mental health reports and refugee claims: lessons and future directions

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Purpose: There is an unmet need for clinicians to perform psychiatric assessments on people going through the refugee determination process. In September 2017, an inter-professional workshop on mental health reports and refugee claims was organized for lawyers and clinicians to foster collaboration and improve access.

Methods: The planning committee met over for over a year to organize this event. A needs assessment was conducted, showing that many respondents were interested in how to write reports and that most had never conducted an assessment before. The event took place in Toronto and was live-streamed to Montreal, Vancouver, and Ottawa. Clinicians were educated about the purpose, content, and types of mental health reports; lawyers were educated about the applications of mental health evidence and about trauma-informed work. Needs assessment data, registration data, and anonymized event evaluations were collected and analyzed.

Results: 100 individuals participated in-person in Toronto. Anonymized post-event feedback was collected from the Toronto participants. There were 41 evaluations completed, of which 98% rated the event positively, and 100% stated that participation in the event facilitated discussion. Most respondents reported that the event satisfied their objectives well (95%), was relevant to practice (95%), increased competence (95%), increased knowledge (95%), increased skill level (88%), increased awareness (95%), and increased comfort/confidence (88%).

Conclusions: Inter-professional workshops can be an effective tool to improve collaboration on and increase capacity for refugee report writing. Future work can expand on this pilot by educating family doctors, psychologists, social workers, and other allied health professionals.
Applying pharmacogenetics in antipsychotic drug treatment: An update

Kazunari Yoshida, MD, PhD, James L. Kennedy, MD, Daniel J. Müller, MD, PhD

Numerous genetic variants have been shown to be associated with antipsychotic response and adverse effects for treatment of schizophrenia. However, clinical application of these findings is limited. The aim of this review is to summarize most recent publications and recommendations related to the genetics of antipsychotic treatment and shed light on the clinical utility of pharmacogenetics/pharmacogenomics (PGx). We reviewed the literature for PGx studies with antipsychotic drugs (i.e. antipsychotic response and adverse effects) and commonly used commercial PGx tools for clinical practice. Publications and reviews were included with emphasis on articles published between January 2015 and April 2018). We found 44 studies focusing on antipsychotic response and 46 studies on adverse effects (e.g. antipsychotic-induced weight gain, movement disorders, hormonal abnormality, and clozapine-induced agranulocytosis/granulocytopenia), however, the result of this field remains complicated and mixed. Overall, several gene variants related to antipsychotic response and adverse effects in the treatment of patients with schizophrenia have been reported and several commercially pharmacogenomics tests have become available. However, further well-designed investigations and replication studies in large and well-characterized samples are needed to facilitate the application of PGx findings into clinical practice.
Background: Although studies have established the clinical and cost-effectiveness of integrated care (IC) models for patients with comorbid mental and physical illness, little is known about whether these models facilitate a patient-centered care experience from the patient’s perspective.

Objective: This scoping review aims to comprehensively review the literature on the experiences of patients in IC settings to surface the existing gaps in our knowledge around important aspects of care from the patient’s perspective to inform quality improvement initiatives.

Methods: A scoping review was conducted in the following databases: MEDLINE, EMBASE, PSYCHINFO, CINAHL, AMED, the Cochrane Library, and grey literature. Our search results yielded 2611 unique resources of which 24 qualitative studies, one thesis dissertation, and one summary report met our eligibility criteria for analysis.

Results: Analyses of the existing evidence revealed variability in implementation efforts and a lack of clearly examined structural facilitators and barriers to IC implementation. Structural integrity when implementing IC models may be important as it has the power to transform the patient experience by a) alleviating or failing to reduce stigma experienced by patients while accessing care b) facilitating therapeutic alliances and spaces to meet population needs c) individual’s experience for timely and personalized care.

Conclusion: Effective patient engagement and experience of patient-centeredness are shaped by interactions with care providers and structural elements in the care model. Thus, successful implementation and sustainability efforts demand thoughtfully balancing between structural standardization and adaptability of the model to address specific contextual factors related to the targeted population needs.
Purpose: Neuroinflammation plays an essential role in the advancement of both Alzheimer’s disease (AD) and subcortical ischemic vascular disease (SIVD). Bioactive oxylipins, are multifunctional molecules involved in the regulation and resolution of inflammation. The relationships between oxylipins, AD and SIVD remain to be clarified.

Methods: Cross-sectional cohort study (n=84), including AD (n=30) and non-AD (n=54) participants, and strata of extensive (n=43, SIVD) or minimal (n=41, Non-SIVD) white matter hyperintensities (WMHs). WMHs were identified through multimodal MRI and quantified using a personalized semi-automatic processing pipeline. The serum oxylipins were extracted through solid phase extraction and quantified with UPLC-MS/MS. Executive function was assessed using the Stroop and Trail-Making B (TMT-B) tests. The indirect effects were assessed using a path model with inferential bootstrapping procedure (10,000 permutations).

Results: In a multivariate analysis of covariance model controlling for age and sex, the lipoxygenase (LOX)-derived dihomo-gamma-linoleic acid metabolite, 15(s)-hydroxyeicosatrienoic acid (n=81) was lower in SIVD (F1,80 =11.51, p=0.001) but not AD (F1,80 =2.74, p=0.102). In participants with extensive SIVD but no AD (n=28), two LOX derived linoleic acid metabolites, 9-hydroxyoctadecadienoic acid (HODE) and 13-HODE, were found to mediate the indirect effect of periventricular white matter hyperintensity volumes on executive functions: TMT-B (13-HODE: -.039, 95% bootstrap confidence interval (CI) [-.092, -.011]; 9-HODE: -.052, 95% bootstrap CI [-.11, -.02]) and Stroop color (13-HODE: -.010, 95% bootstrap CI [-.024, -.003]; 9-HODE: -.009, 95% bootstrap CI [-.024, -.001]).

Conclusions: The generation of LOX metabolites may be compromised in SIVD. These metabolites might be protective against the cognitive decline caused by white matter injury.
**Full Abstract**

**Purpose:** To understand and apply the plan-do-study-act (PDSA) cycle to modifiable cardiovascular risk factors (height, weight, blood pressure, smoking history, metabolic monitoring) of patients prescribed any antipsychotic medications on the general psychiatric unit (GPU) at the Centre for Addiction and Mental Health.

**Methods:** We reviewed a random sample of charts of 30 patients admitted and discharged to the GPU between October to December 2017 and (1) monitored metabolic monitoring of any above parameters taken during their inpatient stay and (2) record patients’ medication regimen, including antipsychotic, antihypertensive or cholesterol-lowering medications. (3) Reviewed compliance rates and themes that may have promoted or detracted from having these measures taken while admitted.

**Results:** Compliance for all measures was generally high with height, weight, blood pressure and smoking history (proxy was nicotine replacement therapy) at 100%. Metabolic monitoring labwork (HbA1c and a fasting lipid panel) had compliance rates of 70-80%. We discovered that certain groups of patients: including younger, those with non-primary psychotic disorders, and agitated individuals, or those who refused blood work on admission were less likely to complete monitoring. We applied an Ishiwara diagram and process mapping to delineate where decisions and difficulties may lie and reflected this back to the care team. We discussed the possibility of creation of electronic order sets for metabolic monitoring and further liaison with laboratory services to improve compliance of metabolic rates.

**Conclusions/Implications:** Several factors increase the likelihood of lack of metabolic monitoring in the CAMH inpatient unit. Future implementations of potential solutions may improve current rates.
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