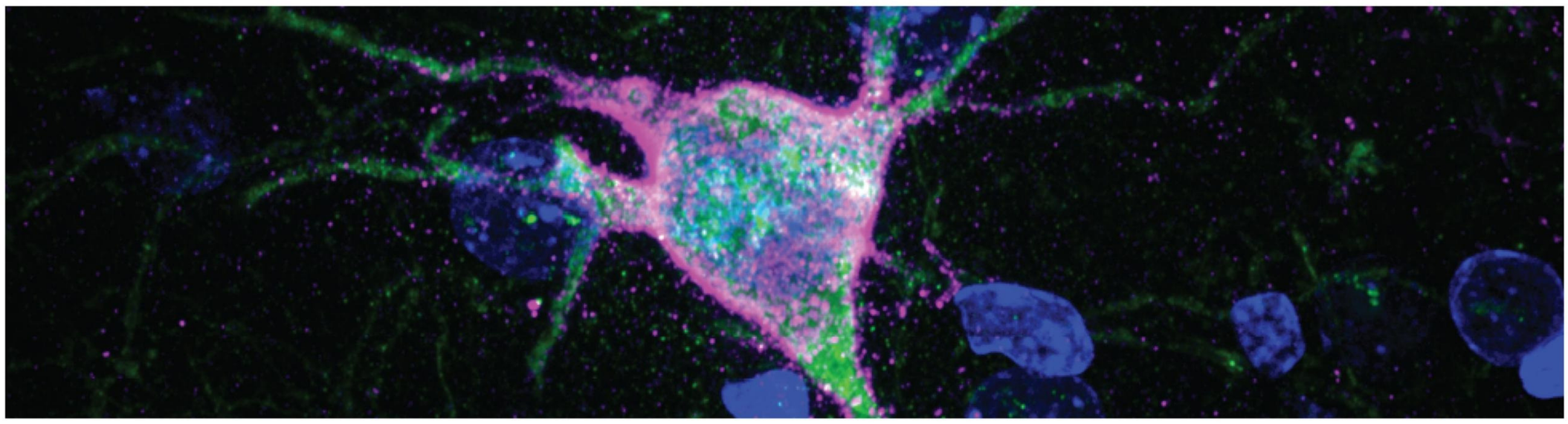

UNIVERSITY OF ALBERTA
FACULTY OF MEDICINE & DENTISTRY

18th Annual
Department of Psychiatry
Research Day

Abstract Book

Keynote Address: **Dr. Raymond W. Lam**, **MD, FRCPC**

Cognitive Dysfunction in Depression:
Focus on Work Functioning

Wednesday, May 15, 2019
Bernard Snell Hall

UNIVERSITY OF ALBERTA

DEPARTMENT OF PSYCHIATRY
FACULTY OF MEDICINE AND DENTISTRY
OFFICE OF THE CHAIR

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May 15th, 2019

Welcome to the 18th Annual Research Day of the Department of Psychiatry at the University of Alberta.

Going into its 18th anniversary, Psychiatry Research Day 2019 showcases and celebrates recent findings from our basic and translational research programs including developments in neurochemistry, genetics, imaging, neuropsychiatry, and psychotherapy. Many of these programs involve collaborative research with colleagues from other departments and institutions locally, nationally, and internationally. Over the years, the Department of Psychiatry has developed very strong MSc and PhD programs to complement our excellent residency program, with some of our residents enrolled in the MSc program. Our trainees represent our department exceedingly well by winning many national, provincial, university and faculty scholarships and awards and by disseminating their research at scientific conferences throughout the world.

Research Day this year has a focus on precision medicine in mental health, as suggested by the graduate students. Our invited speakers cover a range of topics from this area and others, including a presentation by Dr. Katherine Aitchison at the start of the day, Dr. Raymond Lam providing the keynote presentation as part of Psychiatry Grand Rounds at lunch, and Dr. Bo Cao in the afternoon. Following last year's successful format, we will again have short presentations from our graduate students including Mohammad Alam, Beatriz Carvalho Henriques, James Benoit, Daniela Gomez, Morganne Held, Michal Juhas, Jessica Luki, Tyler Marshall, Brad Necyk, John Paylor, Matt Reeson, Jeff Sawalha, Reham Shalaby, Raheem Suleman and Eszter Wendlandt. Poster presentations from our trainees and collaborators will also be presented throughout the day. The top presentations by research trainees will be acknowledged with awards.

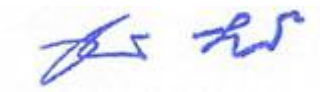
Our keynote speaker this year is Dr. Raymond Lam, from the University of British Columbia (UBC) in Vancouver. Dr. Raymond Lam is a Professor and BC Leadership Chair in Depression Research in the Department of Psychiatry at UBC, and Director of the Mood Disorders Centre. Dr. Lam is also a lead investigator for the Canadian Biomarker Integration Network in Depression (CAN-BIND), a multiphase, multicentre study on biomarkers for treatment response. Dr. Lam's work is at the forefront of research into the clinical and neurobiological factors underlying mental health illnesses, such as seasonal, atypical, difficult-to-treat, and workplace depression. He has published over 400 scientific articles (including over 300 peer-reviewed publications) and book chapters, and edited or authored 9 books on depression. Dr. Lam's keynote lecture entitled, "Cognitive Dysfunction in Depression: Focus on Work Functioning" will discuss his ground-breaking work in identifying clinical and neurobiological factors underlying depression, befitting the theme of this year's event.

We are grateful to all our research trainees and their supervisors for their contribution to the vital research in our department. Special thanks to our organizing committee: Jessica Luki, Daniela Gomez, Jeff Sawahal and Morganne Held (our graduate student representatives); Tara Checknita (heart & soul of Research Day); and Dr. Esther Fujiwara for their tireless efforts in organizing this year's Research Day.

Dr. Lam's visit to our department was supported in part by the Faculty of Medicine and Dentistry via the Walter Mackenzie Visiting Speaker Fund, and we are extremely grateful for this generous support. Lastly, we would like to gratefully acknowledge funding from Lundbeck Canada, Sunovion, Janssen Pharmaceutical, IBM Alberta Centre for Advanced Studies, and AltaML for this important venture.

Thank you for joining us and celebrating our research accomplishments from the past year.

Best Wishes,



Dr. Xin-Min Li, MD, PhD, FRCPC
Professor and Chair, Department of Psychiatry
Faculty of Medicine and Dentistry, University of Alberta

ACKNOWLEDGEMENTS

The Department of Psychiatry is grateful to the following for their financial support:

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WALTER MACKENZIE VISITING SPEAKER FUND

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18th Annual Psychiatry Research Day

Wednesday, May 15, 2019

Bernard Snell Hall

8:30 am – 9:00 am	**Coffee & Poster Set-up**
9:00 am – 9:15 am	**Opening Remarks – *Dr. Andrew Greenshaw***
	Professor & Associate Chair Research
9:15 am – 10:00 am	***Dr. Katherine Aitchison*** **- Departmental Speaker**
	Professor, Department of Psychiatry, University of Alberta
	"Pharmacogenomics and Therapeutics in Psychiatry: An Overview and Update"
10:00 am – 10:40 am	**3-Minute Thesis Talks** by Psychiatry Graduate Students

1. *James Benoit*
2. *Jessica Luki*
3. *Morganne Held*
4. *Raheem Suleman*
5. *Mohammed Alam*
6. *Beatriz Carvalho*
7. *Daniela Gomez*

10:40 am – 11:00 am	**Poster Session**
11:00 am – 12:00 pm	**Lunch**
12:00 pm – 1:00 pm	***Dr. Raymond Lam*** **– Keynote Speaker**
	Professor, Department of Psychiatry, University of British Columbia
	"Cognitive Dysfunction in Depression: Focus on Work Functioning"
1:00 pm – 1:45 pm	**3-Minute Thesis Talks** by Psychiatry Graduate Students

~~8. *Michal Juhas*~~
9. *Tyler Marshall*
10. *Brad Necyk*
11. *John W. Paylor*
12. *Matthew Reeson*
13. *Jeff Sawalha*
14. *Reham Shalaby*
15. *Eszter Wendlandt*

1:45 pm – 2:15 pm	**Poster Session and Refreshments**
2:15 pm – 3:00 pm	***Dr. Bo Cao*** **- Departmental Speaker**
	Assistant Professor, Department of Psychiatry, University of Alberta
	"Machine Learning in Psychiatry: An Introduction and Applications"
3:00 pm – 3:30 pm	**Student Awards Presentation and Closing Remarks** –
	Dr. Esther Fujiwara, Graduate Program Director

3-Minute Thesis Talks by Psychiatry Graduate Students: AM

10:00 am – 10:40 am

Presenter	*Title*
1. James Benoit	Using automated machine learning for predicting treatment response in major depressive disorder patients treated with Pristiq
2. Jessica Luki	Comparison of GABA/glutamate ratios in medial prefrontal cortex and left dorsolateral prefrontal cortex
3. Morganne Held	Interaction of the multi-faceted antidepressant phenelzine with human MAO: unexpected mechanistic insights
4. Raheem Suleman	The NESBID trial: Transcranial direct current stimulation for the amelioration of ultra treatment-resistant depression
5. Mohammed Alam	Role of ambient temperature on APP processing in cultured astrocytes and its potential implication in AD pathology
6. Beatriz Carvalho	Development of a cross platform genotyping method for identifying hybrid CYP2D6 alleles
7. Daniela Gomez	Relationships between neurocognitive impairment and long-term exposure to antiretroviral medications in HIV

3-Minute Thesis Talks by Psychiatry Graduate Students: PM

1:00 pm – 1:45 pm

Presenter	*Title*
~~***8. Michal Juhas***~~	~~White Matter Microstructure Changes during Early Recovery from Alcohol Use Disorder~~
9. Tyler Marshall	Shared decision-making in the treatment of opioid use disorder: A scoping review
10. Brad Necyk	Research-creation in health
11. John W. Paylor	Imaging cellular plasticity after perineuronal net loss in animal models of schizophrenia
12. Matthew Reeson	Evaluation of an Episodic Treatment Centre for Childhood Sexual Abuse Survivors
13. Jeff Sawalha	Digital speech analysis: prediction and differential diagnosis of PTSD symptoms and severity
14. Reham Shalaby	Enhancing peer support experience for patients discharged from acute psychiatric care: protocol for a randomized controlled pilot trial
15. Eszter Wendlandt	Exploring changes in inter-hemispheric cortical networks and myelination after stroke in relation to function remapping

POSTER PRESENTATIONS

10:40am - 11:00am & 1:45pm - 2:15pm

POSTER PRESENTATIONS

10:40am - 11:00am & 1:45pm - 2:15pm

POSTER PRESENTATIONS

10:40am - 11:00am & 1:45pm - 2:15pm

Speaker Biographies

Dr. Raymond Lam is Professor and BC Leadership Chair in Depression Research in the Faculty of Medicine, University of British Columbia (UBC) and Associate Head for Research and International Affairs for the UBC Department of Psychiatry. Dr. Lam is also Director of the Mood Disorders Centre Research, Education, Awareness and Care Hub at the Djavad Mowafaghian Centre for Brain Health in Vancouver. His research examines clinical and neurobiological factors in seasonal, treatment-resistant and workplace depression, clinical trials and guidelines, digital technologies, and global mental health. Dr. Lam is also a lead investigator for the Canadian Biomarker Integration Network in Depression (CAN-BIND) and Executive Director of the Asia-Pacific Economic Cooperation (APEC) Digital Hub for Mental Health, hosted at UBC.

Dr. Katherine Aitchison is a Professor in the Department of Psychiatry, an Adjunct Professor in the Department of Medical Genetics at the University of Alberta, and a Consulting Psychiatrist with Alberta Health Services. Together with collaborators, her lab conducts a program of work, "precision health for mental health." Whilst this includes work aiming to understand aetiological factors in order to contribute to illness prevention and early detection, her presentation will focus on pharmacogenomics, specifically how variation in a person's DNA may affect response to medications used in psychiatry and how testing for this can be conducted. In both Dr. Aitchison's clinical practice and the research conducted by her team, the aim is to empower those with lived experience (patients and their caregivers) in shared decision-making with their health care providers.

Trained in mathematics (BSc), psychology (MSc), computational neuroscience (PhD), neuroimaging and psychiatry (postdoc), **Dr. Bo Cao (Cloud)** has a strong passion for understanding the fundamental mechanisms of how the brain works and how to cure the brain when the mechanisms are disturbed. One of his main research interests is computational psychiatry and precision medicine in mental health. Dr Cao hopes to develop translational tools that can provide accurate and personalized diagnosis and treatment optimization for mental disorders. He hopes to achieve this by identifying objective biomarkers associated with mental disorders and their treatment outcomes through multimodal data including brain imaging, genetic, biological, behavioral, cognitive and clinical measurements, and by applying advanced machine learning and statistical algorithms to these data.

Screening University Students for Internet Addiction and ADHD

Katherine Aitchison **(Departments of Psychiatry and Medical Genetics, University of Alberta); Esther Yang (Departments of Psychiatry and Medical Genetics, University of Alberta); Keanna Wallace (Departments of Psychiatry and Medical Genetics, University of Alberta); Garima Aryal (Departments of Psychiatry and Medical Genetics, University of Alberta); Leslie Roper (Departments of Psychiatry and Medical Genetics, University of Alberta); Rohit J. Lodhi (Department of Psychiatry, University of Saskatchewan); Dawon Lee (Departments of Psychiatry and Medical Genetics, University of Alberta); Penny Carnes (American Foundation for Addiction Research); Richard Isenberg** (American Foundation for Addiction Research); Bradley Green** (University of Southern Mississippi); Patrick Carnes** (American Foundation for Addiction Research); **joint senior authors

Objectives: This study is a part of a collaborative project aiming to identify genetic markers associated with addiction and related conditions. Control recruitment consists of two questionnaires screening for addiction and mental health status and providing a genetic sample. Herein, we explore positive screening for ADHD and internet addiction in university students.
Methods: University of Alberta students are being recruited as a control group to compare to the clinical sample receiving treatment for addiction. Students who express interest complete a series of self-report screening questionnaires for addictive and related behaviors and conditions, including the 20-item Internet Addiction Test and the ADHD Adult Self-Report Scale V1.1.
Results: We received interest from 3477 students, with 2503 being included in our analysis of anonymized encoded data. A total of 554 participants (22.1%) screened positive on the ASRS V1.1. A total of 154 participants in total (6.2%) screened positive on the IAT.
Those screening positive on the ASRS V1.1 were 50.6% in those screening positive on the IAT, compared to 20.3% in those not screening positive on the IAT. A Pearson Chi-Square test showed that this between-group difference was significant $X2$ ($df = 2$, $N = 2503$) = 77.7, $p < .001$.
Conclusion: Our findings indicate that students screening positive on the IAT are more than twice as likely to screen positive for ADHD than students who screen negative on the IAT. Although the IAT and ASRS V1.1 are screening tools not diagnostic instruments, these preliminary findings may indicate overlap between the clinical phenotypes.

Presentation: Poster presentation

Role of ambient temperature on APP processing in cultured astrocytes and its potential implication in AD pathology

Mohammad Alam (Department of Psychiatry, University of Alberta); Glen Baker (Department of Psychiatry, University of Alberta); Satyabrata Kar (Faculty of Medicine & Dentistry, University of Alberta)

Alzheimer's disease (AD), the most common type of senile dementia, characterized by the presence of β-amyloid (Aβ) neurotic plaques, tau neurofibrillary tangles and the loss of neurons in specified regions of the brain. Currently, there is no effective treatment for AD patients. Evidence suggests that increased level/aggregation of Aβ peptide can contribute to neuronal loss and subsequent development of AD pathology. These Aβ peptides are generated from their precursor, amyloid precursor protein (APP), which is processed proteolytically by either the amyloidogenic β-secretase or the non-amyloidogenic α-secretase pathways. Some recent studies emphasize that, ambient temperature may influence disease progression and/or pathology in animal models and AD patients. However, very little is known about the mechanisms by which temperature can influence Aβ metabolism in cells. In our experimental system we used astrocytes, the most abundant glial cells in the brain, to evaluate how temperature can influence APP processing leading to the generation of Aβ-related peptides. Our data show different level of changes in the cluster of proteins associated with APP metabolism in hypo-/hyperthermic conditions. We also demonstrated that hypothermic condition may affect cell viability more than normal as well as hyperthermic condition in astrocytes. This study indicates that ambient temperature may influence AD-related pathology by regulating the production as well as clearance of Aβ peptide.

Presentation: Poster and Thesis Talk

When you feel like quitting; think about why you started - Motivation in nursing practice

Shamsa Ali (Department of Nursing, University of Alberta), Hunaina Murad (MN Program, Faculty of Nursing, University of Alberta)

Motivation is an inner force which energizes an individual to fulfill set goals. Motivation is regarded as an integral part of improving the nurse's performance. Motivation is considered as the dynamics of behavior. Maslow's hierarchy of needs helps to understand human behavior. The fulfillment of the needs of the working individual in the work environment will ultimately result in effective performance. Moreover, motivation and feeling states are regarded as one of the significant elements of Kim's structure of deliberation. In addition, Vroom's expectancy theory also highlighted that the employees are motivated if their efforts and performances are recognized and rewarded by the organization. Furthermore, Skinner's reinforcement theory of motivation suggested that nurses should be reinforced either positively or negatively to improve the quality of nursing care. However, punishments and extinctions can be avoided to enhance the stress-free work environment. The researchers suggest that nurses have their own intrinsic and extrinsic motivational factors to attain the best possible outcomes. Intrinsic factors such as knowledge and skill, dedication towards the profession, remuneration, and self-esteem, play an important role in motivating a nurse. Whereas, self-validation, work environment, past experiences, family, and peer support are the extrinsic motivational factors. Motivation can be achieved through improved management activities, encouraging leadership responsibilities and opportunities to grow and learn, positive reinforcement, refreshing sessions, patient's co-operation, and incentives. Overall, the nurse's motivation should be considered worthwhile for the continuation of quality care practices.

Keywords: motivation, intrinsic factors, extrinsic factors

Presentation: Poster presentation

The associations between medication and physical activity in children with Attention-Deficit/Hyperactivity Disorder

Katrina Aranas (Department of Educational Psychology, University of Alberta); Yuanyuan Jiang (Department of Educational Psychology, University of Alberta)

Attention-Deficit/Hyperactivity Disorder (ADHD) is the most common neurodevelopmental disorder in children and presents as pervasive, developmentally-inappropriate symptoms of inattention, hyperactivity, impulsivity, or a combination (American Psychiatric Association, 2013). Empirically-supported treatments are medication and behavior management (American Academy of Pediatrics, 2011), but there is widespread consensus for a need of more treatment options (MTA Cooperative Group, 1999; Smith & Shapiro, 2015). Like medication, physical activity (PA) increases the production of dopamine and norepinephrine and affects the regulation of both these neurotransmitters for ADHD (Troksa et al., 2018). Thus, as medications target ADHD symptom, so too does PA (Cerrillo-Urbina et al., 2015; Wigal, Emmerson, Gehricke, & Galassetti, 2012). Researchers therefore suggest that PA could be an adjunct or an alternative to medication, but very little is known on the extent to which PA affects the catecholamine functioning in those with ADHD (Cerillo-Urbina et al., 2015; Cornelius, Fedewa, & Ahn, 2017). The purpose of this study is to identify how engagement in PA is associated with the use of medication in children with ADHD in the local community. It is hypothesized that the more PA the child is engaged in, the less medication intake and the less PA the child is engaged in, the higher the medication intake. Understanding whether PA is related to the use of medication in children with ADHD can provide more evidence for the theory that PA may be an alternative or an adjunct to medication for children with ADHD.

Presentation: Poster presentation

Maintenance Ketamine Therapy for Treatment Resistant Depression: A Case Series

Shaina Archer (Department of Psychiatry, University of Alberta); Carson Chrenek (Department of Psychiatry, University of Alberta); Jennifer Swainson (Department of Psychiatry, University of Alberta)

Ketamine is known to have a rapid antidepressant effect in some patients with treatment-resistant depression (TRD). While the antidepressant effect of ketamine can be robust, it is often short lived. To date, there are few reports that address sustaining the antidepressant effects of ketamine. In this study, we reviewed the safety, tolerability, and efficacy of the ongoing use of maintenance ketamine infusions. This study is a retrospective case series, reporting on 11 patients with either unipolar or bipolar TRD who received maintenance ketamine infusions, defined as infusions beyond an acute series of six to eight treatments. In total, 11 patients received maintenance ketamine treatment, with the total number of infusions ranging from 10 to 51. All patients in this case series were noted to have a reduction in their Beck Depression Inventory score from baseline with the use of maintenance ketamine, and there were no clinically significant adverse effects. At the study endpoint, four patients were continuing maintenance ketamine, with one patient who transitioned to intranasal ketamine. Four patients discontinued ketamine due to loss of effect, one due to perceived side effects, and the reason was unknown for two patients. In conclusion, maintenance ketamine infusions may be an effective way of maintaining response in select patients. No major adverse events were noted in this case series. Future research is required to identify characteristics of patients likely to benefit from maintenance ketamine treatments, to determine optimal frequency and duration of treatment, and to monitor for adverse effects over a longer time period.

Presentation: Poster presentation

Pharmacogenomics of clozapine-associated myocarditis in a Canadian cohort

Bahareh Behroozi Asl (Neuroscience and Mental Health Institute, University of Alberta); Jason Gross (HLS Therapeutics Inc., Ontario, Canada); Richard Choi (St Joseph's Health Centre, Ontario, Canada); Lynne Postovit (Department of Oncology, University of Alberta); Katherine J. Aitchison (Departments of Psychiatry and Medical Genetics, University of Alberta)

Clozapine is the drug of choice for treatment-resistant schizophrenia. Although uncommon, myocarditis is a potentially lethal adverse effect. Whilst some clinical risk factors have been identified, cases may occur in the absence of these. This study aims to identify genetic and epigenetic biomarkers predictive of clozapine-associated myocarditis.

We hypothesize that:

1. The combination of non-wild type variants at more than one cytochrome P450 enzyme relevant to the metabolism of clozapine could lead either to the formation of unusual antigens and, on representation, a type I hypersensitivity reaction, or, when in combination with other drug metabolizing enzyme and transporter variants, a direct toxic effect on the myocardium.
2. The risk of a type I hypersensitivity reaction could be moderated by relevant loci such as the chromosome 5 cytokine gene cluster (encoding IL-3, IL-4, IL-5, IL-9, IL-13, and granulocyte-macrophage colony-stimulating factor, or GM-CSF).
3. The risk of a direct toxic effect could be moderated by genetic variants in other enzymes and transporters relevant to the clearance of reactive intermediates.
4. Epigenetic variants affecting the expression of relevant genes may moderate the above associations.

To investigate the above, we propose to use a national register of patients prescribed clozapine to ascertain patients with and without clozapine-associated myocarditis. Genetic markers will be analyzed by array-based methods supplemented by in-house assays. Epigenetic variants will be analyzed by bisulphite sequencing. Replication and validation of any biomarkers thus identified and whole genome sequencing will be achieved through collaboration with the PROCLAIM Consortium.

Presentation: Poster presentation

Using automated machine learning for predicting treatment response in major depressive disorder patients treated with Pristiq

James Benoit (Department of Psychiatry, University of Alberta); Serdar Dursun (Department of Psychiatry, University of Alberta); Russell Greiner (Department of Psychiatry, University of Alberta); Matthew Brown (Department of Psychiatry, University of Alberta); Andrew Greenshaw (Department of Psychiatry, University of Alberta)

Background

Major depressive disorder (MDD) is the condition that contributes most to healthy years lost to disability and has low rates of treatment success. Patients often require several medication switches before an effective medication is found: a trial and error process. Techniques using machine learning hold potential for predicting treatment success with a particular medication. This study uses baseline and two-week follow-up clinical data to create a machine learning model that predicts what a patient's treatment response status will be after eight weeks of desvenlafaxine (DVS) treatment.

Methods

We applied an automated machine learning software called RapidMiner to data from 2860 MDD patients in 11 phase-III/IV clinical trials, to produce a model predicting patient response: an eight-week Hamilton Depression Rating Scale (HAM-D) score <= 50% of their baseline HAM-D score.

Outcomes

The trained classifier had an accuracy of 71.0%, significantly greater than the probability of classifying a patient correctly by chance (54.0%).

Our model, based on 13 clinical features, proved sufficient to predict DVS response significantly better than chance. This may allow more accurate use of DVS and allow treatment outcome to be determined in two weeks, rather than eight weeks. This work is a first step towards changing psychiatric care by incorporating clinical decision support technologies using machine learned models.

Presentation: Poster and Thesis Talk

What do you see in a face?

Alexa Byrd (Department of Psychology, University of Alberta); Mursal Mohamud (Department of Psychology, University of Alberta); Christopher Westbury (Department of Psychology, University of Alberta); Esther Fujiwara (Department of Psychiatry, University of Alberta)

Alexithymia is a personality trait characterized by a reduced ability to experience and express emotions. Although not a disorder, people with mental health problems like depression, anxiety, and addictions often have high alexithymia. When an emotional expression is ambiguous or otherwise obscured, emotion recognition can be compromised in individuals with alexithymia. How does alexithymia influence the ability to understand emotions in others? People with high alexithymia may engage less with others and they may also have less knowledge about emotions. To test how these two deficits relate to each other we will analyze data from an eye-tracking experiment in which about 80 people with either high or low alexithymia looked at emotional face photographs and verbally described the emotions. Participants' gaze patterns (e.g., fixations on facial eye- and mouth regions) and their verbal descriptions of the emotions (e.g., the specificity and emotionality of the descriptions) will be examined. By doing so, we will advance our understanding of how early processing of emotional information (and later production of emotion labels) differs between individuals with high or low levels of alexithymia. Since alexithymia is a well-known risk factor for mental illnesses, understanding how this trait changes social-emotional attention and emotional interpretation could advance knowledge in psychiatry.

Presentation: Poster presentation

Sleep disorders in persons with dementia: An overview of current treatments

Antonia Cappella (Geriatric Psychiatry Fellow, University of Alberta); Glen Baker (Department of Psychiatry, University of Alberta); Lawrence Pawluk (Department of Psychiatry, University of Alberta)

Background: Age-related sleep changes including advanced sleep phase, increased sleep latency, decreased total sleep time, increased sleep fragmentation, decreased slow-wave sleep, reduced REM sleep and reduced sleep efficiency are common amongst older adults. Sleep disturbances are even more prevalent in persons with dementia (PWD). It is estimated that >40% of PWD experience sleep disturbances including insomnia, daytime somnolence, circadian rhythm disturbance, REM sleep behaviour disorder and sleep disordered breathing. Over the past 15 years there has been growing research in the field of sleep disorders in PWD.

Methods: MEDLINE (including PubMed), Embase and CINAHL Plus searches were performed for English language publications up to January 2019 with no limit set on date of initial publication. The search generated 4270 articles (excluding repeats). All titles were reviewed for relevance and 214 articles reviewed in their entirety.

Results: There are a number of studied pharmacological interventions for the management of sleep disturbances in PWD; these interventions include use of melatonin, cholinesterase inhibitors, antipsychotics, sedative-hypnotics, stimulants and herbal supplements. In addition, a number of non-pharmacological interventions including bright-light therapy, exercise, cranial stimulation, socialization programs, sleep hygiene and multi-modal approaches thereof have been examined for the management of sleep disorders in PWD.

Conclusion: Despite growing interest in the field of sleep disturbances in PWD there is a relative paucity of evidence for both the pharmacological and non-pharmacological management of such conditions. Further research, particularly randomized control trials, is required before definitive recommendations can be made regarding the management of sleep disturbances in PWD.

Presentation: Poster presentation

Development of a cross platform genotyping method for identifying hybrid CYP2D6 alleles

Beatriz Carvalho Henriques (Department of Psychiatry, University of Alberta); Yabing Wang (Department of Psychiatry, University of Alberta); Xiuying Hu (Department of Psychiatry, University of Alberta); Catelyn Slom (Department of Psychiatry, University of Alberta); Evangeline Tsapakis (Department of Medical Genetics, University of Alberta); Paramala Santosh (Institute of Psychiatry, Psychology and Neuroscience, King's College London); Ian Craig (Institute of Psychiatry, Psychology and Neuroscience, King's College London); Katherine Aitchison (Department of Psychiatry, University of Alberta)

For the majority of medications used to treat mental health conditions, clinical guidelines state that pharmacogenomics either could or should be used to tailor prescribing practice. Fourteen of these drugs are antidepressants (medications used to treat depression), with CYP2D6 and CYP2C19 being the relevant genes. Developing robust techniques able to identify important alleles that contribute to mutant phenotypes is desirable due to CYP2D6 relevance to medicine and pharmacology for being involved in the metabolic pathway of up to 50 different drugs, including but not limited to haloperidol, risperidone and imipramine. Here, we selected individuals with gene copy number calls compatible with the presence of hybrid alleles, derived from recombination between gene CYP2D6 and the pseudogene CYP2D7. Our objective is to identify precisely which variants are present among our sample pool. In this manner, the improvement in technology gained will enable correct identification of a wider range of variants of this enzyme than was previously possible, for translation into clinical practice in the form of more accurate pharmacogenetics testing.

Presentation: Poster and Thesis Talk

Cognitive Stimulation Therapy and Quality of Life

Iris C. I. Chao (Faculty of Rehabilitation Medicine, University of Alberta); Katarzyna Nicpon (Faculty of Rehabilitation Medicine, University of Alberta); Mary R. Roberts (Department of Occupational Therapy, University of Alberta)

Introduction: 564 thousand Canadians are now living with dementia; this number will further rise due to the increasing aging population. Occupational therapists assist people with dementia to retain their existing function, promote relationships and social participation, and improve quality of life. Cognitive Stimulation Therapy (CST) is an evidence-based non-pharmacological intervention to enhance improvements in cognition and quality of life for people with mild to moderate dementia. The concepts of CST are compatible with occupation-based models, for example, Person-Environment-Occupation (PEO), and is an intervention that can be delivered by occupational therapists. Objectives: To determine the strength of the evidence regarding CST to improve quality of life of patients with mild to moderate dementia. Methods: A critical literature review was conducted to evaluate the methodological quality of relevant studies. The Guidelines for Critical Review (GCR), the Jadad scale for assessing the quality of randomization, and the Effective Public Health Practice Project Quality Assessment Tool (EPHPP) were used to complete a critical appraisal of the selected articles. Results: Eight publications were retrieved for review. Three out of the eight studies indicated significant improvements in overall quality of life. The global EPHPP scores showed two studies were of strong methodological quality, while four were moderate, and two were weak. Conclusions: Results indicate the potential usefulness of CST for improving quality of life for older adults with mild to moderate dementia. With expertise in psychosocial interventions and dedication to evidence-based practice, occupational therapists are well-positioned to implement CST.

Presentation: Poster presentation

Relationships between neurocognitive impairment and long-term exposure to antiretroviral medications in HIV

Daniela Gomez (Department of Psychiatry, University of Alberta); Precious Amusan (Neuroscience and Mental Health Institute, University of Alberta); Christopher Power (Department of Neurology, University of Alberta); John Gill (Department of Medicine, University of Calgary); Noshin Koenig (Southern Alberta Clinic, Alberta Health Services); Esther Fujiwara (Department of Psychiatry, University of Alberta)

Despite the availability of life-preserving antiretroviral therapy (ART), neurocognitive deficits persist among people living with HIV (PLWH). A previous study by our group found that CNS penetrance of ART was an important predictor of neurocognitive impairment. Emerging evidence also suggest that non-ART CNS-active medications (NC-AEs) negatively influence neurocognitive performance in PLWH. Given that PLWH are dependent on ART, and NC-AEs to manage comorbidities, it is imperative to understand the association between these medications and cognition. Following the methods from our previous study, we empirically determined neurocognitive performance profiles in 287 PLWH from Southern Alberta. ART exposure was quantified as the years of prescription duration of the five most common ART classes. Exposure to NC-AE was quantified as the sum of all NC-AE prescribed within the last six months. Machine learning was used to find the most important predictors of neurocognitive impairment. Three cognitive profiles emerged: Two non-impaired groups (n = 129; high performance; n = 127; intermediate performance), and one neurocognitively impaired group (n = 31). ART duration variables were among the most important predictors of the neurocognitively impaired group. Among these, duration of protease and integrase inhibitor prescriptions were particularly prominent. Higher exposure to NC-AEs also characterized the impaired group. Longstanding intake of certain ART may negatively influence cognition. While potential neurotoxic effects of protease inhibitors have long been known, long-term prescription of integrase inhibitors demands attention, especially combined with NC-AEs. Integrase inhibitor effects on CNS function should be explored experimentally.

Presentation: Poster and Thesis Talk

Interaction of the multi-faceted antidepressant phenelzine with human MAO: unexpected mechanistic insights

Morganne Held (Department of Psychiatry, University of Alberta); Dmitriy Matveychuk (Department of Psychiatry, University of Alberta); Glen Baker (Department of Psychiatry, University of Alberta); Andrew Holt (Department of Psychiatry, University of Alberta)

Phenelzine (βphenylethylhydrazine; PLZ) is a non-selective irreversible monoamine oxidase (MAO) inhibitor with antidepressant and anxiolytic properties. A multifaceted drug PLZ also inhibits GABA transaminase and sequesters aldehydes. In recent years, PLZ has been reported to be effective in attenuating symptoms of traumatic brain injury and spinal cord injury in animal models, and it has been proposed that these effects are the result of its scavenging action on the reactive aldehyde acrolein. Irreversible inhibition of MAO is thought to occur through enzymatic oxidation of PLZ to yield highly reactive phenylethyldiazene (PEDz), which has been presumed to alkylate MAO's flavin cofactor in situ. As such, PEDz is undetectable following incubation of PLZ with MAO. However, near-stoichiometric amounts of a reversible MAO inhibitor, phenylethylidenehydrazine (PEH) are released. Several published hypotheses have sought to explain this anomalous observation by proposing the existence of alternate catalytic pathways, or release of PEH followed by intramolecular rearrangement to generate PEDz.

Preliminary observations from our laboratory reveal that the rate of MAO inactivation decreases as PLZ concentration increases, while the inactivation half-life is shorter at higher enzyme concentrations. We hypothesise direct catalytic formation of PEDz, which is unable to alkylate reduced flavin and which must first dissociate from the enzyme before competing with PLZ for re-entry to the active site of reoxidised MAO. Further, in bulk solvent, proton exchange between PEDz and water results in rapid depletion of PEDz and formation of PEH. Anticipated results may caution against use of PLZ as a prodrug to generate neuroprotective PEH.

Presentation: Poster and Thesis Talk

Epigenetic modifications in stress response genes associated with childhood trauma

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Adverse childhood experiences (ACEs) may be referred to by other terms (e.g., early life adversity or stress and childhood trauma) and have a lifelong impact on mental and physical health. For example, ACEs have been associated with post-traumatic stress disorder (PTSD), anxiety, depression, bipolar disorder, diabetes and cardiovascular disease. The heritability of ACE-related phenotypes such as PTSD, depression and resilience is low to moderate, and, moreover, is very variable for a given phenotype, which implies that gene by environment interactions (such as through epigenetic modifications) might be involved in the onset of these phenotypes.

Currently, there is increasing interest in the investigation of epigenetic contributions to ACE-induced differential health outcomes. Although there are a number of studies in this field, there are still research gaps.

In this review, the basic concept of epigenetic modifications (such as methylation) and the function of the hypothalamo–pituitary–adrenal (HPA) axis in the stress response is outlined. Examples of specific genes undergoing methylation association with ACE-induced differential health outcomes are provided. Limitations in this field, e.g., uncertain clinical diagnosis, conceptual inconsistencies, and technical drawbacks are reviewed, with suggestions for advances using new technologies and novel research directions. We thereby provide a platform on which the field of ACE-induced phenotypes in mental health may build.

Presentation: Poster presentation

White Matter Microstructure Changes during Early Recovery from Alcohol Use Disorder

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Harmful use of alcohol is one of the leading preventable risk factors for global health. Chronic alcohol abuse leads to wide-spread structural brain damage, which is especially noticeable in white matter atrophy and fibre degradation. In this study, we have compared diffusion tensor brain imaging scalars of 58 detoxified alcohol dependent patients during approximately the first month of supervised abstinence to 51 matched healthy controls. We have observed a significant decrease in the axial diffusivity and fractional anisotropy, while an increase in the radial and mean diffusivities. This scalar pattern has been reported as associated with underlying microstructural axonal degradation. Comparison of the longitudinal changes during the early abstinence has yielded mixed results, especially due to significant dropout and related adverse impact on the statistical power and interpretability of the results. The relative scarcity of monitored longitudinal alcohol use disorder recovery studies highlight both the challenges as well as importance of similar studies. Limitations of our study include broad age range, multi-site recruitment, and inclusion of only adult male participants. Future studies should aim to recruit larger sample sizes and follow-up with longer interscan intervals.

Presentation: Poster and Thesis Talk

Intranasal Ketamine for Treatment Resistant Depression: A Case Series

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Treatment Resistant Depression (TRD) is a challenging presentation within psychiatry and occurs in approximately 15% of patients with depression. These patients do not achieve remission of symptoms despite multiple trials of pharmacotherapy, psychotherapy, and neurostimulation treatments such as ECT. The finding that ketamine results in a rapid antidepressant effect in some patients with TRD is promising. Although the response has been shown to be robust, the duration of effect is unfortunately short-lived. Few reports have looked at maintaining the antidepressant effects of ketamine for a more sustained time period.

At the Misericordia Community Hospital, select patients who have shown a good clinical response to acute treatment with intravenous (IV) ketamine have been offered to continue with maintenance treatment with IV ketamine. While some patients have had a positive clinical response to maintenance IV ketamine, this treatment remains very resource-intensive as it must be done in a hospital setting. To ease this burden on both the patient and the hospital resources, some psychiatrists have elected to offer maintenance intranasal (IN) ketamine, which the patient can self administer at home.

The case series will review 17 patients with TRD who have received maintenance IN ketamine in the 2017 year.

Presentation: Poster presentation

Comparison of GABA/glutamate ratios in medial prefrontal cortex and left dorsolateral prefrontal cortex of healthy controls

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GABA and Glutamate (Glu) are responsible for inhibitory and excitatory transmission in the brain, and their imbalance could play a role in the pathophysiology of depression. Previous magnetic resonance spectroscopy (MRS) studies have shown dysregulation of brain GABA levels in patients with major depression (MD), as well as abnormal Glu levels in MD patients. However, GABA and Glu have not been measured simultaneously, making interpretation of one neurotransmitter's dysregulation difficult without information of the other, considering their antagonistic activity. The medial prefrontal cortex (MPFC) and left dorsolateral prefrontal cortex (LDLPFC) are regions that regulate mood and have been implicated in the pathophysiology of depression. We used the MEGA-PRESS MRS method to simultaneously measure Glu and GABA, and compared the ratios of GABA/Glu in the MPFC to the LDLPFC in healthy controls (HC). Six perimenopausal women, screened for the absence of mental illnesses, were scanned using a 3 Tesla Siemens Prisma MR scanner during the follicular phase of their menstrual cycle. An optimized PRESS localization sequence was used for acquisition of the glutamate signal, and a MEGA-PRESS sequence for the selective measurement of GABA. There was a statistical trend suggesting that MPFC GABA/Glu ratios (0.906±0.235) were lower than LDLPFC GABA/Glu ratios (1.194±0.343, $p = 0.067$). Considering the statistical trend and our small sample size, recruitment of additional HCs and comparison with MD patients may lead to valuable information for the understanding of the role of GABA/Glu ratio of the MPFC and the LDLPFC in the brain of HCs and MD patients.

Presentation: Poster and Thesis Talk

Eye preference in speeded emotion recognition: alexithymia and eating disorders

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Eating disorders (EDs) such as anorexia (AN) or bulimia (BN) are psychiatric conditions characterized by disordered eating, concerns over body weight and shape, and fear of weight gain. EDs are also often accompanied by social-emotional problems. Comorbid alexithymia has been suggested to explain objective emotion processing deficits in EDs, but we recently observed ED-specific problems with mixed facial emotions (anger and disgust) that were not explainable by high alexithymia. In order to allow alexithymia-related (and ED-unspecific) emotion recognition deficits to emerge we here probed performance with two speeded tasks. A total of 33 patients (25 AN; 8 BN) from the University of Alberta Hospital Eating Disorder Program and 82 non-ED controls (40 high alexithymia HC-HA, 42 low alexithymia HC-LA) were recruited and eye-movements were recorded while participants judged facial expressions using either verbal labels or by identifying similarities between emotional expressions ("odd-man out"). Groups performed similarly in the verbal task, but in the 'odd-man-out' task, both the ED group and the HC-HA group were slower than the HC-LA group, implying alexithymic (i.e., non-ED-specific) performance detriments. However, the ED group showed a pronounced eye-avoidance for all faces in this task, unlike either of the control groups. Verbal labels may provide an opportunity to offset emotion recognition problems in both ED and HC-HA; the observation of an ED-specific eye-avoidance in the nonverbal task suggests a source other than alexithymia underlying some of the social-emotional issues observed in EDs. Understanding reasons for this eye-avoidance appears useful to develop treatment targets in EDs.

Presentation: Poster presentation

Does Socioeconomic Status Influence the Association between Diet Quality and Depression? Findings from Alberta's Tomorrow Project

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Recent meta-analyses have concluded that diet quality is associated with the risk of depression independent of socioeconomic status (SES). However, whether the association between diet and depression varies across different SES groups has yet to be studied. The aim of the present study was to evaluate the interaction between diet quality and SES, measured by educational attainment and household income, as risk factors for depression. Baseline survey data from Alberta's Tomorrow Project (ATP), a prospective cohort of adults 35-69 years, was linked with Alberta Health administrative data (2000-2015). The primary outcome was the number of health care contacts with depression as the primary diagnostic code according to ICD-9-CM or ICD-10-CM, following enrollment. The Healthy Eating Index Canada 2015 (HEI-C-2015) was used to evaluate diet quality. Negative binomial models adjusting for comorbidities, sociodemographic, and lifestyle factors were fitted to the data. Participants were, on average, 50.4 (±9.2) years old, 62.8% were female, and 65.7% were overweight or obese. Overall HEI-C-2015 score was 62.4, suggesting moderate diet quality. Every 10-unit improvement in the overall HEI-C-2015 score was associated with a 4.24% reduction in the number of depression-related health care visits (p=0.007). Income did not modify the effect of diet quality on depression (p=0.8209), but education showed significant interaction (p=0.018). Results suggest that depression in adulthood is associated with diet quality, although effects differ according to SES category. Promoting healthy eating may help reduce the burden of depression in adulthood while decreasing the burden of chronic disease.

Presentation: Poster presentation

Shared decision-making in the treatment of opioid use disorder: A scoping review

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Objectives: 1) Establish the breadth and depth of relevant scientific literature related to shared decision-making (SDM) in adults with opioid use disorder (OUD); 2) Summarize the impact of SDM on health and patient-centered outcomes. Design: Scoping review. Methods: We searched five electronic databases, Google Scholar, reference lists of identified studies, and contacted international experts for peer-reviewed literature of SDM in adults (18+) with OUD. Studies were included if treatment decision-making methods were used according to our operational definition of SDM. Case-studies, editorials, and articles not printed in English were excluded. Two independent reviewers screened all articles, extracted the data, and assessed the quality of the studies. Data were charted in tables and analyzed descriptively. Consultation with our stakeholders continued throughout the study period. Results: 713 articles were initially identified. 10 quantitative and three qualitative studies (total of 1,775 participants) were included for analysis. The quantitative literature suggested that SDM may not impact health outcomes (e.g., illicit drug use), while seven studies did not report any patient-centered outcomes (e.g. satisfaction with care). Three qualitative studies found that people with OUD desired to be involved in treatment-related decisions (e.g. SDM). Conclusion: SDM neither appears to be widely utilized nor studied in the context of OUD treatment. Among the few studies that investigated SDM, patient-centered outcomes were infrequently reported. Included studies were methodologically heterogeneous, which hindered further analysis. Future studies are warranted to explore the impact of SDM on both health and patient-centered outcomes, as improving these outcomes may be vital for comprehensive care.

Presentation: Poster and Thesis talk

Research-creation in health

Brad Necyk (Department of Psychiatry, University of Alberta)

The emerging field of research-creation brings the creative act and its outcomes as valid forms of scholarly research. In 2012, Chapman and Sawchuk published an article entitled "Research-Creation: Intervention, analysis, and 'family resemblances'" in which they described four categories or 'family resemblances' of research-creation: research-for-creation, research-from-creation, creative presentations of research, and creation-as-research. I align my own work and research in the final category of creation-as-research, an assemblage of all the categories, yet also extends beyond them. They describe creation-as-research as "an engagement with the ontological question of what constitutes research in order to make space for creative material and process-focused research-outcomes" (Chapman and Sawchuk, 2012: 49). Over the past four years, I have been creating creative content from my ethnographic research activities with patients living with illness across Canada. In this presentation, I would like to share some of the stories I learnt from these research experiences and the creative outcomes from them.

Presentation: Thesis Talk

Substance use in youth

Nazish Pachani (Department of Nursing, University of Alberta)

Youth is the time period of vast exploration and curiosity. Young people begin to explore the world around. They acquire pleasure and satisfaction by carrying out risky behaviors to satisfy their impulse. Substance use is one such action that young people get attraction from certain individual, familial, social and environmental variables. Young people's past, as well as present stressful experience and maladaptive coping style, create strong affinity. In addition, youth consider substance use as an antidote for all chronic and acute pain rather than adopting healthy coping techniques. The role of media is very influential. Youth watch their stars indulging in substance use, which motivates children to try substances either at home or with their peers irrespective of considering its adverse effects on health. Diverse researches have favored that pubertal transition, parenting style, family cohesiveness, maternal use, modelling, conditioning, and socialization reflect on youth's upbringing. It is evident that substance use is one of the cognitive and behavioral outcomes. There is a need to construct a most supportive zone around youth that enables them to broaden their horizon of emotional intelligence. As a healthcare professional, knowledge about all the levels of prevention can aid communities to have an addiction-free environment. Individual counselling, family therapy, national and international awareness programs would help in eradicating substance use. Collaborative work of Governmental and Non-Governmental Organizations (NGO's) would motivate youth to acquire a substance-free lifestyle.

Presentation: Poster presentation

Imaging cellular plasticity after perineuronal net loss in animal models of schizophrenia

John W. Paylor (Department of Psychiatry, University of Alberta); Mischa V. Bandet (Neuroscience and Mental Health Institute, University of Alberta); Ian R. Winship (Department of Psychiatry, University of Alberta)

In our lab, we are investigating the hypothesis that excessive or dysregulated neuroplasticity can contribute to the development of schizophrenia. In previous work, we have evaluated the integrity of structures called perineuronal nets, which surround central nervous system neurons and restrict neuronal plasticity. These structures are lost in the post-mortem tissue of those who suffered from schizophrenia and we have recapitulated these deficits in animal models of schizophrenia. Furthermore, the direct disruption of perineuronal nets in healthy animals can induce behavioral disruptions consistent with a schizophrenia-like phenotype in rodents. However, to date, we have not been able to show the direct consequences on cellular function and structure as a result of perineuronal net loss. Thus, our planned project intends to evaluate the cellular mechanisms by which perineuronal net loss affects neural cells and the networks within which they reside. To conduct this study, we will utilize genetic strains of animals that express fluorescent proteins in their cortical neurons along with our lab's multi-photon laser scanning microscope, which can image this fluorescence while animals are alive and behaving. Additionally, animals will receive injections of a drug called Chondroitinase ABC which degrades the components of perineuronal nets. Using this unique combination of techniques, we can evaluate how cells change over time in awake and behaving animals and provide a novel insight into the cellular consequences of perineuronal net degradation. A better understanding of this process will provide insight for our findings from animal models of schizophrenia, as well as in schizophrenia itself, where perineuronal nets are depleted.

Presentation: Poster and Thesis Talk

Evaluation of an Episodic Treatment Centre for Childhood Sexual Abuse Survivors

Matt Reeson (Department of Psychiatry, University of Alberta); Andrew Greenshaw (Department of Psychiatry, University of Alberta); Peter Silverstone (Department of Psychiatry, University of Alberta); Margot Jackson (Department of Nursing, University of Alberta)

Background: Child sexual abuse (CSA) in an all too prevalent form of childhood trauma worldwide. In Canada, rates of CSA have been estimated as 15% for females and 5% for males. As such, there is a growing need for novel treatment programs aimed at improving the lives of CSA survivors. Episodic multimodal treatment programs incorporate a number of different therapies to provide a wider range of treatment. The goal of this project is to evaluate a treatment program currently in use at the Little Warriors Be Brave Ranch (BBR)—an episodic multimodal treatment facility for youth CSA survivors located outside Edmonton.

Methods: Data is collected in the form of surveys; each survey contains a battery of self-reported outcome measures. The Be Brave Ranch has two separate programs: The Child Program designed for children aged 8-12, and the Adolescent Girls Program designed for females aged 13-17. Each program includes 4 visits to the BBR that spans over the course of 1-year. Surveys are collected at initial admission and discharge for each visit.

Results: Twenty-four girls aged 13-17 completed their initial 2-week visit. Surveys were done at admission and discharge. Self-esteem saw the highest improvement (38.1% increase), while depression, anxiety, and PTSD symptoms all reduced by nearly 30%.

Conclusions: Preliminary data on the Adolescent Girls Program shows significant improvement after the initial visit. Episodic multimodal treatment programs have the capacity to treat a wide-range of domains and are therefore more likely to induce lasting, positive effects for CSA survivors.

Presentation: Poster and Thesis Talk

Negative feedback assigned to students is associated with sympathetic arousal indexed by Empatica E4

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Stressful situations such as receiving critical feedback induce anxiety and can lead to increased electrodermal activity (EDA). This study aims to determine how negative feedback can impact students' arousal states to avoid its deleterious ego-threat effects. Participants (n = 10) were asked to play a poster-making game individually, designing three posters. After submitting each poster, the participants received three pieces of positive or negative feedback from game characters according to a yoked experimental study design. EDA was measured for the duration of the game using Empatica E4 wristband. Based on the amount of negative feedback they received, two groups were distinguished. Group A comprised the five people with the highest amount of negative feedback received. Group B comprised the five people with the lowest amount of negative feedback received. Skin conductance response (SCR) represents a spike on the EDA data indicating an arousal response and it was computed using Ledalab and EDA Explorer. The amplitudes of SCRs and the frequency per minute were averaged for each group. Findings showed that all amplitude averages for group A were higher than those for group B. Because higher amplitudes indicate a stronger arousal response, we can assume that the participants who were assigned negative feedback more often (Group A) experienced stronger arousal than those who received negative feedback less often. Also, results showed that higher average frequencies indicate that participants who were assigned negative feedback more often were more likely to experience higher arousal states than the rest of the participants.

Presentation: Poster presentation

Digital speech analysis: prediction and differential diagnosis of PTSD symptoms and severity

Jeff Sawalha (Department of Psychiatry, University of Alberta); Russ Greiner (Department of Psychiatry, University of Alberta); Andrew Greenshaw (Department of Psychiatry, University of Alberta); Serdar Dursun (Department of Psychiatry, University of Alberta)

Occupational stress bears significant risk of Posttraumatic Stress Disorder (PTSD). In PTSD, early diagnosis and early treatment interventions are advantageous for positive outcomes. Developing technology for early diagnosis and prediction of vulnerability to PTSD can help reduce costs and personal suffering, specifically in military and first responder personnel. Some earlier work has focused on predictive analysis via neuroimaging biomarkers, but acoustic speech analysis can provide a dynamic, accessible, cost-effective and non-invasive partial solution to prediction. Establishing speech analysis methods can provide a operational assessment tool that can be used by clinicians in conjunction with structured interviews. This will be achieved using machine learning techniques to distinguish prosodic features (speaking rate, pitch, rhythm, and power) between healthy controls and PTSD patients. We will deploy a randomized control design where participants will be recruited at the operational stress injury clinic (OSI) as part of the target group (PTSD) or the control group. Standard psychiatric measures such as the Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder scale (GAD-7), and other psychiatric scales will be used to assess presence, co-morbidity of other disorders and severity of PTSD. We will also collect audio data from subjects during this process. Once data collection is complete, the goal will be to: 1) Identify people who reach diagnostic criteria for PTSD 2) measure symptom severity and 3) predict prognosis outcomes and response to different treatments. This project is a collaboration between the computational psychiatry group at the University of Alberta, Alberta Machine Intelligence Institute (AMII), and the IBM Watson Center.

Presentation: Poster and Thesis Talk

Empirical scanpath analysis in emotional face processing

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Emotional face processing represents a minimal but essential element of social cognition. Many psychiatric conditions are characterized by changes in social-emotional behaviour, but assessment of these changes relies largely on self-report. We asked whether we can empirically identify different ways that people scan emotional faces then use this information to predict psychiatric diagnoses (ED: anorexia, bullimia) and traits linked to mental health (alexithymia, depression, anxiety, stress). For this purpose, eye-tracking data acquired during an emotional face processing task were used, sampled from a student population (N=167). We focused on visual scanpaths or series of eye movements over time. Rather than pre-determining regions of interest (ROIs) such as eyes and mouth regions, we applied an approach developed by Chuk, Chan, and Hsiao using hidden Markov models to derive ROIs from the eye data themselves, which were used to classify viewers into groups with different overall viewing patterns. Two distinct viewing patterns emerged: one group's scanpath had fixations dispersed across the entire face, without clear preferences for eye or mouth regions (Group1), while the second group showed a strong eye-preference (Group2). We then tested whether the two groups had different degrees of alexithymia and mood symptoms (depression, anxiety, stress). Preliminary analyses showed statistically significant differences in alexithymia, but not mood, between groups: Group2 had substantially fewer individuals with alexithymia than Group1. Thus, face viewing patterns as identified here could be useful as an objective way to characterize and differentiate alexithymia. Application to data from a group of ED patients is planned.

Presentation: Poster presentation

Enhancing peer support experience for patients discharged from acute psychiatric care: protocol for a randomised controlled pilot trial

Reham Shalaby (Department of Psychiatry, University of Alberta), Rabab Abou El-Magd (Department of Psychiatry, University of Alberta), Wesley Vuong (Addiction and Mental Health, Alberta Health Services), Shireen Surood (Addiction and Mental Health, Alberta Health Services; Faculty of Social Work, University of Calgary), Liana Urichuk (Department of Psychiatry, University of Alberta; Addiction and Mental Health, Alberta Health Services), Vincent I O Agyapong (Department of Psychiatry, University of Alberta; Addiction and Mental Health, Alberta Health Services)

Introduction: This study will evaluate the effectiveness of an innovative peer support program. The program incorporates leadership training, mentorship, recognition and reward systems for peer support workers, and supportive/reminder text messaging for patients discharged from acute (hospital) care. We hypothesize that patients enrolled in the peer support system plus daily supportive/reminder text messages condition will achieve superior outcomes in comparison to other groups. Methods and analysis: This is a prospective, rater-blinded, four-arm randomised controlled trial. 180 patients discharged from acute psychiatric care in Edmonton, Alberta, Canada will be randomised to one of four conditions: (1) enrollment in a peer support system; (2) enrollment in a peer support system plus automated daily supportive/reminder text messages; (3) enrollment in automated daily supportive/reminder text messages alone; or (4) treatment as usual follow-up care. Patients in each group will complete evaluation measures (eg, recovery, general symptomatology and functional outcomes) at baseline, 3 months, 6 months and 12 months. Patient service utilisation data and clinician-rated measures will also be used to gauge patient progress. Patient data will be analysed with descriptive statistics, repeated measures and correlational analyses. The peer support worker experience will be captured using qualitative methods.

Presentation: Poster and Thesis Talk

The NESBID trial: Transcranial direct current stimulation for the amelioration of ultra treatment-resistant depression

Raheem Suleman (Department of Psychiatry, University of Alberta); Olivia Guerra (Department of Psychiatry, University of Alberta); Robert Mallett (Department of Psychiatry, University of Alberta); Michael Wlasichuk (Department of Psychiatry, University of Alberta); Andrew Greenshaw (Department of Psychiatry, University of Alberta); Serdar Dursun (Department of Psychiatry, University of Alberta); Michael L. Demas (Department of Psychiatry, University of Alberta)

Depression is a chronic, debilitating mental illness that can exert emotional, cognitive, and neurovegetative effects on patients, leading to a profoundly decreased quality of life. In Canada, 4.7% of the population will suffer from a depressive episode annually, resulting in an estimated $32.3 billion in lost productivity. Although remission is possible, more than one in five Canadians have treatment-resistant depression (TRD) that fails to respond to multiple therapeutic trials.

Conceptually, both unipolar and bipolar depression can be understood as dysfunction in the integration and relative activity of neuronal networks. All therapies seek to restore balance to these systems of emotional appraisal and cognitive functioning. Transcranial direct current stimulation (tDCS), which uses low amplitude electrical current to modulate synaptic transmission, is safe, can be delivered in an outpatient setting without need of anesthesia, and is a promising treatment option for refractory depression.

Here, we present the rationale and design of the NESBID study, an ongoing, double-blinded, randomized control trial evaluating the effectiveness of once-daily tDCS for unipolar and bipolar TRD. Inpatients and outpatients recruited from various Edmonton-area hospitals will receive either a sham or active stimulus, in addition to treatment as usual, for thirty, 30-minute sessions. By comparing their scores on the Montgomery-Asberg Depression Rating Scale (primary outcome), and the Quick Inventory of Depressive Symptomatology, World Health Organization Disability Assessment Schedule, and a side effect inventory (secondary outcomes), we hope to demonstrate the utility of tDCS in this patient population.

Presentation: Poster and Thesis Talk

Detecting depression from voice

Mashura Tansim (Department of Computing Science, University of Alberta); Eleni Stroulia (Department of Computing Science, University of Alberta)

Depression is a common psychological disorder, affecting more than 300 million people around the globe and is considered as the leading cause of disability worldwide. Current depression diagnostic instruments require active participation of the depressed individuals. However, due to lack of awareness and the nature of the disorder itself, a large percentage of population refrain from seeking expert assistance. Recent studies reveal that depression is reflected in fluctuations of people's speech and day-to-day activities. These findings have motivated a wave of research efforts aimed at developing automated depression-detection methods based on vocal acoustic features. Since 2013, the introduction of the "Depression Recognition Sub-Challenge" (DSC) as a part of the "Audio/Visual Emotion Challenge" (AVEC) has spurred research on depression recognition, based on multi-modal data, i.e., audio, video and text. In our work, we are interested in developing a practical system that can capture the audio of the users' voice during phone-call conversations and analyze it to detect their depression level. A pre-requisite for such a system is a model capable of detecting evidence of depression from conversational audio. In this work we explored the effectiveness of different machine-learning algorithms for the anticipated depression detection model with the currently available AVEC data sets.

Presentation: Poster presentation

Prevalence of Developmental Disabilities and Fetal Alcohol Spectrum Disorder in Adult Forensic Psychiatric Patients

Roxoliana Tsisar (Department of Psychiatry, University of Alberta); Maryana Kravtsenyuk (Department of Psychiatry, University of Alberta)

Persons with pervasive developmental delay (PDD) and fetal alcohol spectrum disorder (FASD) are known to be overrepresented in the criminal justice system and in forensic psychiatric hospitals. One of the most challenging tasks for forensic psychiatrists working with this cohort of patients is community reintegration. Timely transition back into the community is hindered by the lack of specific forensic programming and developmental services support for these individuals. In fact, the majority of the literature in this
area of research focuses on youth, with scarce data on the adult population and their complex mental health needs. A literature review was conducted to identify other studies in order to determine the prevalence of FASD, developmental disorders, and intellectual disability among adult forensic psychiatric inpatients, as well as examine the challenges this cohort faces in forensic settings. A total of six articles were reviewed and our findings identified five major themes during the literature review. Overall, the complex mental health needs of the FASD and PDD forensic population remain to be unmet due to various obstacles to successful reintegration of this population back into the community, despite their disproportionately high representation in the forensic system. This problem received little attention in the literature, and it remains one of the largest service gaps in forensic rehabilitation. The opportunity exists to improve efforts in this area. The knowledge gained from this will help guide clinicians to develop appropriate resources to support patients with PDD/FASD in forensic settings.

Presentation: Poster presentation

Exploring changes in inter-hemispheric cortical networks and myelination after stroke in relation to function remapping

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Functional recovery after stroke is driven by mechanisms of central nervous system plasticity - including the structural reorganization of neuronal networks and the re-establishment of patterns of myelination across them. The time-course and extent of these type of re-patterning, however, are not well understood and their relation to recovery not well defined. In this project, after inducing a photothrombotic stroke of the forelimb somatosensory representation in mice, we concurrently track the peri-infarct changes in the pattern and density of both cortical myelinated fibers and fibers projecting from the contralateral homotopic areas. Myelinated fibers are imaged in vivo using SCORE microscopy - a novel label-free imaging technique that can resolve single cortical myelinated fibres - while fibers projecting from the contralateral cortex are imaged using two-photon microscopy of eGFP-expressing neurons. Functional changes are simultaneously monitored via Optical Signal Imaging of the remapping responses in the fore- and hindlimb somatosensory representations and behavioral recovery is tracked through the cylinder and pole tasks. Quetiapine is administered orally to assess its potential as a cortical pro-myelinating agent in the post-stroke brain. Preliminary analysis indicates a symmetric and severe loss of both contralateral fibers and myelinated fibers in the immediate peri-infarct areas, with a robust re-emergence of both within days 7-14 following the initial injury - a timescale very similar to the functional remapping of the forelimb somatosensory representation. These results help clarify the comparative timelines and functional importance of re-establishing cross-hemispheric structural networks and peri-infarct myelination as potential post-stroke mechanisms of plasticity.

Presentation: Poster and Thesis Talk