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Institute of Neurosciences, Mental Health and Addiction (INMHA)

Second Substance Abuse, Prevention and Treatment Initiative Workshop

Workshop Report

Vancouver, British Columbia
November 9 – 10, 2011

Table of Contents

Introduction

CIHR's Institutes of Neuroscience, Mental Health and Addiction hosted their Second Annual Substance Abuse Prevention & Treatment Initiative Workshop on November 9-10, 2011 in Vancouver BC. The meeting brought together more than 30 members of the academic research community, government representatives and other national stakeholders. Participants shared results from research projects funded by CIHR under the National Anti-Drug Strategy (NADS) and also provided lively discussion about the future directions of CIHR-INMHA's strategic priorities for research in addiction.

The specific objectives of the meeting were to:

- Share results of funded research by CIHR under the National Anti-Drug Strategy;
- Inform CIHR-INMHA's new Strategic Plan (2012-2017) in the area of addiction research;
- Inform CIHR-INMHA on key strategic areas of research in the context of NADS funding received by CIHR-INMHA.

The National Anti-Drug Strategy provided funding to CIHR for fiscal years 2007-2012. Additional support was provided by INMHA to fund the different competitions of the program. Most of the projects reviewed at the meeting were funded through the CIHR *Catalyst Grants for the Prevention and Treatment of Illicit Substance Use* (funds awarded in 2009). These grants were intended to provide seed money, on a short-term basis, to support health research activities which represent a first step towards the pursuit of more comprehensive funding. In addition researchers shared the outcomes of a project funded through a CIHR *Knowledge Synthesis Grant for the Prevention and Treatment of Illicit Substance Use.* These grants are the cornerstone of knowledge translation. They transform vast libraries of scientific literature into knowledge that is reliable, relevant and readable for knowledge users. As well we heard about results of projects funded by a large CIHR *Team Grant- Substance Abuse Prevention and Treatment.* These Team Grants support expert teams of talented and experienced researchers to undertake work that will contribute to our understanding of alcohol, psychotropic pharmaceutical and illicit drug use (including stimulants such as cocaine and methamphetamine), abuse and addiction as well as relevant cross-addictions and co-morbidity problems. During the meeting, participants shared the many positive outcomes of these grants. A brief summary of each presentation is included in Part 1 of this report.

Two breakout sessions were conducted to brainstorm about a proposed Canadian Clinical Intervention Network in Addiction (CINA). Participants were fully engaged in discussion and shared their points of view about essential elements, the existing strengths and barriers or challenges that will be encountered in establishing this network in a Canadian context. A summary of the discussions is compiled in Part 2 of this report.

Opening Remarks Dr. Elizabeth Theriault and Dr. Anthony Phillips

Dr. Elizabeth Theriault opened the meeting by facilitating an informal introduction of all the attendees. Dr. Anthony Phillips, INMHA's Scientific Director welcomed all the participants to this workshop, the second of this type hosted by INMHA. Dr. Phillips set the context for the meeting by discussing the meeting objectives.

Since 2007, CIHR has received funding from the National Anti-Drug Strategy (NADS) with a focus on the treatment action plan. As a consequence of these five years of funding, Canada has developed tremendous strength in the area of addiction medicine and has created networks to share ideas, to share opportunities to work together, and to identify and share best practices. The purpose of the meeting was to share the results of research, to share ideas for moving forward, and to build partnerships and collaborations. As well, Dr. Phillips expressed that the intent of this meeting would contribute to determining the best approach for clearly indicating how addiction medicine and research can be supported within the context of the INMHA Strategic Plan 2012 – 2017, currently in development.

As an introduction to the breakout sessions taking place both days of the meeting, Dr. Phillips described the NIDA Clinical Trials Network (CTN) and how it is organized into nodes throughout the US. He articulated INMHA's intention of creating similar nodes in Canada, to serve as critical resources for addiction research and to provide opportunities to partner with NIDA. This will enable Canada to build on the strengths and achievements of an established network, and would provide us with unique opportunities to highlight Canadian innovations and discoveries to serve uniquely Canadian populations.

Dr. Phillips concluded by encouraging all researchers in attendance to maintain their optimism and commitment to this area, and to continue to build this into a vibrant area of research. He thanked all the attendees for devoting their time to this workshop and welcomed their feedback and ideas.

Part 1: Research Grant Presentations

The British Columbia Methadone Prescribing Study

Dr. Amy Salmon, Coordinator, Sheway and Clinical Assistant Professor, UBC School of Population and Public Health

Methadone Maintenance Therapy (MMT) is a well-established treatment modality for addressing the health and social harms associated with opioid addiction. While most of the research that examines the availability, effectiveness and retention of MMT has focused on drug users, Dr. Salmon's study is to investigate the nature, sustainability and treatment practices of BC's methadone prescribing workforce, in an effort to find out better ways to retain the physicians. There are 390 physicians who hold an exemption to prescribe methadone for opioid dependency in BC, but only 218 physicians in BC who are actively prescribing methadone for opioid dependency. In order to increase patients' access to MMT, more must be done to encourage greater numbers of physicians to prescribe it. She hopes to determine what preparation, training, education and support do MMT prescribing physicians need and want, to best prepare them for providing, and continuing to provide MMT,

Dr. Salmon provided some background about the treatment barriers and the opposition to increasing the availability of MMT, including the controversial position that the therapy occupies within health care and society, control issues, variable access, legal issues, and associated stigma. Her approach will be to conduct surveys and to collect interview-based data as well as using "snowball sampling" to reach MMT prescribers. To date, two different surveys and three physician interview scripts have been prepared. The survey pilot was sent out to 30 physicians, and survey feedback was received from 12 physicians. Feedback was generally brief and positive, with minor revisions made relating to survey language and content. In November 2011 surveys will be sent to a random sample of 1136 physicians, in the hope to capture both physicians who provide MMT and those who do not.

Dr Salmon aims to understand the differences between the physician groups, by conducting qualitative interviews with a subset of survey respondents. Three interview scripts have been designed: one for current prescribers, one for lapsed prescribers, and one for non-ever prescribers. She described her analysis approach and plans to publish and present the resulting data. She also wants to explore the issue of financial incentives as motivators for those doing the work, as there is criticism and concern about how this may compromise good care. Dr. Salmon hopes to engage and build interest with physicians and work through the murky and contentious areas of practice to eventually help recruit and retain methadone-prescribing physicians.

Key discussion points:

- One study challenge will be in recruiting rural physicians. The random sample will be weighted to have an adequate representation of rural physicians, particularly for the qualitative follow up. She expects that rural physicians will be interested in speaking to her about her studies.

- The names of the physicians qualified to prescribe methadone is "private", and not only makes recruitment challenging but compromises the ability to make claims about representation. This has influenced her strategies for finding methadone and non-methadone prescribing physicians.
- Pharmacist retention in MMT programs is also an issue. The lack of a qualified pharmacist in a community can create a barrier for patients wishing to obtain MMT.
- Discussion of best care models for MMT prescription included whether or not it is appropriate to think about primary health care being the proper level of intervention, in contrast to being dispensed by physicians who only see the patient for MMT and are not monitoring the general health of patients (i.e., pregnancy).

Alternative intervention for marijuana use (AIM): Addressing individual risk factors for transitions to initiation and escalation of marijuana use in early adolescence.

Dr. Marvin Krank, Professor of Psychology, Dean of Graduate Studies, UBC Okanagan

Marijuana use is a major problem among youth and is linked to a host of negative outcomes and risky behaviours, including academic problems, dropping out of school, increased mental health problems, risky sexual activity, unsafe driving practices, and progression to other illicit drug use. Prevention often fails as we try to address too many risk factors or we provide messages that are counterproductive. Progressions from non-use to use and to escalated use can be predicted by individual social and cognitive indicators.

The goal of Dr. Krank's work is to identify factors that lead to these transitions and to identify what can be done to intervene, using the AIM paradigm: A (assessment), I (individualized), M (messages tailored to individual) and S (skills). His research examined the feasibility of an internet-based assessment and feedback prevention program for marijuana use in young adolescents (grades 7-9). Using the internet, the program measures a variety of social and cognitive risk factors in four areas (social cognitive influences, enhancement motivations, coping motivations, and alcohol and drug use initiation) that correlate with substance use and predict initiation and escalation of substance abuse. The program then provides appropriate motivational change feedback or training in alternative behaviours or cognitions.

Dr. Krank presented some of the many outcomes of this study to date. Internet assessments were conducted in nine schools during school hours as part of the health and career curriculum, and were very cost effective. He emphasized that the liaisons with the school districts are absolutely critical for implementing the program.

While the assessment was successful, they didn't find the easily defined clusters that they hoped to find. Their original plan, consistent with brief intervention approaches, was that the assessment and feedback sessions were to be done in two parts. They had some issues in providing interventions over the long term, so adopted a new approach and developed three different modules that included assessment and intervention at the same time. While outcome evaluation of the program is ongoing, the process evaluation determined that the process was successful in that most of the students considered the questions and exercises seriously, students liked the program and the message did get through to them.

Dr. Krank shared his lessons learned and concluded that this program, incorporating internet assessment, motivational feedback and cognitive-behavioural skills training can be administered via internet in a school-based setting.

Key discussion points:

- To address ethics issues, they worked closely with the school which incorporated the program as part of the curriculum. There were no responses to a negative consent program.
- Data security features such data safety protocols, password protections, research ID lists, and computer configurations, were built into the system. They had the ability to contact students if comments indicated self-harm.
- The perceptions about children's and other's use of alcohol and drugs provides strategies for education and for correcting perceptions.
- Attendees encouraged Dr. Krank to continue on this path and the possibilities about synergistically combining this platform with personality targetted work were discussed.
- Is a simple web-based program enough to change activity? Although this will take years to answer, the literature suggests that significant change can be made through web-based intervention.
- This approach is not contradictory, but extremely complementary to other types of interventions. Some kids get the message after just one session, others need many messages. The internet-based assessment is a tool that can be used to identify those who can benefit from various interventions.

Schizophrenia Cannabis Abuse Group

Dr. Stéphane Potvin, Centre de recherche Fernand-Seguin, Department of psychiatry, Université of Montreal

The comorbidity between schizophrenia and cannabis use is very high, with 47% of schizophrenics experiencing a substance use disorder in their lifetime. The consequences of this are quite severe; they are more anxious, depressed, and suicidal, and experience neurological side effects, more legal and health problems, unemployment and homelessness. Close to 50% of mental health costs are related to schizophrenia, mostly due to re-hospitalization for stress, non-compliance to medications, and drug abuse. The cost estimates are $7 billion per year for Canadian society.

Dr. Potvin's research aims to answer two major questions: Why are schizophrenics at more risk of substance abuse, and why is it so difficult for some of them to kick the habit? Using a combination of brain imaging (fMRI) and other methods he compared schizophrenics who do abuse drugs (DD, dual diagnosis) with those who do not.

To explore if those who have dual diagnosis (DD) are more emotionally and socially reactive, Dr. Potvin conducted comparative studies to look at emotional experience and emotional memory. He described the study comparing schizophrenics, schizophrenics who abused cannabis (DD), and control patients. Patients in the study were subjected to positive, neutral and negative emotional images while their brains were being scanned, and they were asked to rate their experience. Although there were no differences in emotional experience between the groups of patients initially, when the images were shown again after a 15 minute time interval, a gradient effect was observed between the controls (who

had the best emotional memory), those with a dual diagnosis and those with schizophrenia (who had the worst emotional memory). One of most important differences between the schizophrenic and the dual diagnosis groups, is the activation of the frontal lobe in the DD group. This demonstrates that the DD is a distinct phenotype, and that the approach taken by Dr. Potvin is working.

His second research idea was to ask if those with a dual diagnosis are more sensitized to cannabis reward. Dr. Potvin used both control and schizophrenic participants who were abusing or dependent on cannabis, but were not abusing any other drugs. Participants were asked to abstain from any type of use for six hours and were then shown images of cannabis. The images elicited higher cravings in the schizophrenics, and the fMRI scans demonstrated activation in the medial part of orbitofrontal cortex.

To explore the idea that there may be common neurobiological disturbances in both models in the brain-reward system, Dr. Potvin measured endogenous cannabinoids (oleylethanoliamide (OEA) and anandamide) in four groups: schizophrenics, dual diagnosis, non-schizophrenic cannabis users and controls. Measuring anandamides and OEA with LCMS demonstrated that the non-psychosis substance-abusing group had decreased levels of both endogenous cannabinoids, while dual diagnosis group had a strong elevation of both endogenous cannabinoids, which suggests that they are involved in human drug addiction. The directionality of the effect depends on presence of a comorbid disorder. Dr. Potvin found these results exciting, and he wants to be able to determine if these simple biomarkers can be predictors of a psychosis and/or addiction.

Dr. Potvin summarized some of the key outcomes of his research, shared lessons learned and also described his next steps for his research.

Key discussion points:

- Inclusion in the studies was based on criteria of abuse and dependence. While they do know the drug quantities that the participants were using, correlation analysis hadn't been completed yet.
- Because "emotional memory" was consistent regardless of whether the memories were positive, negative or neutral, one participant suggested that this could be better termed a "memory effect" rather than an "emotional memory" effect.
- Dr. Potvin described the large amount of in-kind support that they received. Recruitment of study participants is challenging, and he had the help of nurses and research assistants who are paid by the institution.
- Measurement of the endogenous cannabinoids was done in the plasma. The dual diagnosis group had a lot of variability in levels of endogenous cannabinoids.
- More research on bipolar and substance abuse correlations needs to be done; at this time, most studies have been related to schizophrenia and addiction.
- One suggestion was to refine the term "dual diagnosis" as this is a generic term and can introduce some confusion.
- Although the patients in the study were not abusing other substances, they were often using tobacco and alcohol, which may be potential confounders. Future studies will examine correlations between tobacco and schizophrenia.

Acute cannabis consumption and motor vehicle collision risk: A systematic review of observational studies

Jenny Cartwright, Research Coordinator, NS Cochrane Resource Centre, Centre for Clinical Research, presenting for Dr. Mark Asbridge

Impaired driving is a leading cause of preventable morbidity and mortality in Canada, and is a tremendous burden on health care. Recent evidence has shown cannabis as playing an important role in road safety; however research findings on the effects of cannabis on driver impairment and collision risk have been mixed. Dr. Asbridge and his team completed a systematic review and meta analysis of the observational epidemiological literature to answer the question: Does the acute consumption of cannabis (cannabinoids, THC) among drivers increase the risk of a motor vehicle collision?

Ms Cartwright described the process and outcomes of their systematic review and meta-analysis, which used standard methods advocated by the Cochrane Collaboration. Eligibility criteria included studies of motor vehicle accidents with an appropriate control group. They selected studies that measured active THC metabolites in blood, but not urine. The original 2200 studies that were identified were narrowed down to 30, and in the end just nine studies were included. The quality of the studies was all high to medium, as determined using the Newcastle-Ottawa scale. Three studies were case-control studies and six were culpability studies. Five measured fatalities with four measuring serious injuries.

Despite the high level of homogeneity in their meta-analysis, they found consistent and significant results: acute cannabis consumption nearly doubles the risk of a motor vehicle collision. Unfortunately, due to a lack of data, the team was unable to examine dose effects on crash risk and severity. Examination of dose-response effects is important if Canada and other countries are intending to introduce legal limits for measures of cannabis impairment. There is a lack of high quality studies performed in real world settings, however these results bridge the gap between simulator/lab studies and cross-sectional epidemiological studies.

Ms Cartwright summarized the important lessons learned including: the presence of cannabis at the time of a collision is calculated very differently across studies; potentially important confounders may not have been controlled for; and there was not enough data available on THC concentrations to allow conclusions regarding dosage. This study has been accepted by the BMJ and will be published in early 2012.

Key discussion points:

- The team was unable to determine if there was a publication bias, as a minimum number of 10 studies is meant to be used for a funnel plot.
- Although a dose-response relationship wasn't determined, the risk of a motor vehicle collision is greater with a higher THC dose. Of the two studies that did look at dosage, neither measured THC the same way, but both found a higher risk of crash.
- There was not an age bias in the studies, but the studies could be biased in other ways. Confounders such as alcohol and other drugs were removed, which reduced the number of studies and the number of participants included.

- Although these are important findings, the increase in crash risk is quite modest compared to alcohol. The concern is that the interpretation of 'twice the risk' has to be put into context and doesn't account for additions of distracted driving and alcohol.
- There is a dearth of good-quality, rigorous studies to determine dose-response effects.
- Experimental or lab studies generally do show an elevated crash risk from cannabis consumption; however these results cannot be generalized to all real life situations.

The Effect of Ecstasy on Monoamine Neurotransmission

Alan Hudson, Associate Professor, Department of Pharmacology, University of Alberta

Ecstasy is a widely abused drug that is becoming increasingly popular. Unfortunately, there have been a number of ecstasy-related deaths in minors. Ecstasy tablets originally contained (±)-3,4-methylenedioxymethamphetamine (MDMA). Today, “street ecstasy” often contains additional piperazines, notably 1-Benzylpiperazine (BZP), which is inexpensive and legal in Canada. As piperazines are relatively new additives to ecstasy, there has been little scientific study into their harmful effects, and the combined adverse effects of MDMA and piperazines are not known.

Dr. Hudson described his research into the acute neurochemical and behavioural effects of combining MDMA and BZP as compared to their individual administration. He is using a rat model to monitor the release and turnover of monoamines in the brain and to monitor blood levels of ecstasy and the relevant piperazines. He described brain microdialysis techniques that measure the changes to specific neurotransmitters - serotonin, dopamine and noradrenaline - in response to MDMA and BZT in free moving rats, and he can then correlate these neurotransmitter levels with changes in rat behaviour.

Dr. Hudson summarized the results of their studies. BZP has a moderate effect on serotonin levels relative to that of MDMA, but when combined with MDMA, BZP markedly enhances levels of serotonin in the frontal cortex. The effect, if not synergistic, is additive. This same additive effect was observed on the levels of dopamine and noradrenalin in the frontal cortex. Dr. Hudson described the behaviours associated when the drugs were administered, including locomotion, posture, rearing, sniffing and forepaw treading. The two drugs elicited some common behaviours as well as some that were unique to each drug. The conclusion of this study is that, neurochemistry shows that when these two drugs are taken together, dopamine, noradrenaline, and serotonin are all elevated, which implies an increased high from the combination of these two drugs.

The results of this study have been presented to the Office of Controlled Substances at Health Canada. Future research includes looking at emerging drugs of abuse, not just piperazines, but also the cathinones that are currently being sold as "Bath Salts" and "Plant Food". Dr. Hudson would like to look at long-term effects of repeated dosing with respect to sensitization.

Key discussion points:

- Combining two drugs that are proven to be "safe" from a toxicological perspective creates a synergy in the pharmacological effect. To date, no one has examined the toxicology of taking two drugs

together. Dr. Hudson and his collaborators will be looking at structural brain changes, and the long-term effects/damage that occurs as a result of combining drugs.

- The emergence of many new drugs and analogues creates legislation challenges. The scheduling process for emerging drugs is too slow; the legal highs or "herbal highs" are being used by youth with the perception that they are safe. The labs don't know what to look for; sometimes they can only look for controlled substances. There are strong possibilities for collaboration in this country between the policy people, regulatory bodies, laboratories and innovative researchers to overcome these challenges.
- One participant described her experiences in advising a charity that lobbied the UK government to pass legislation to "classify" any emerging drugs showing signs of potential fatal effects for 12 months, to allow time for pharmacological analysis and investigation.
- Canada is one of the main ecstasy exporters, a fact that can bring attention to this issue.
- During discussions, one of the participants suggested specific connections that Dr. Hudson could communicate with regarding his work, illustrating the value of this type of meeting.

Targetting reconsolidation of cocaine memories as a new treatment for cocaine addiction

Dr. Marco Leyton, William Dawson Chair, President, Canadian College of Neuropsychopharmacology
Department of Psychiatry, McGill University

Currently, there are no medications available to treat addiction to stimulant drugs like cocaine. Drug-related cues can trigger craving and increase the probability of drug-seeking behaviour, which is why recovering addicts need to avoid drug-associated people, places or things. Drug-related cues are powerful and the effects are remarkably long-lasting; not only does the efficacy of the drug related cues not diminish over time, but they can become even more robust. The phenomenon of memory reconciliation allows memories to be modified - by new learning, protein synthesis inhibition, electric convulsive shock, and B-adrenergic receptor antagonism - when they enter a labile state during recall. Dr. Leyton and his team are testing novel methods of blocking the reconsolidation of cue-induced cocaine related memories in human dependent users as a way of treating drug addiction.

After providing a review of previous work in the area of cue-induced reinstatement, Dr. Leyton described his research. His focus to date has been to develop and validate appropriate cues for elicited cocaine memories. This work has taken much preparation; his team has produced a film that includes a diverse number of cues, with actors simulating the use of cocaine powder and crack. The control film contains neutral images such as breakfast being prepared. The efficacy of these films was validated in cocaine-dependent volunteers; they determined that the films produced a sustained cue-induced craving.

The movies were shown to volunteers and the effects of two exposures to propranolol were measured using subjective cravings on a self-reported questionnaire. Of the 60 volunteers who were screened, 4 were approved for the study, and two were tested. Dr. Leyton has not broken the blind on this small sample. If results are promising, he will progress to a full-scale clinical trial.

Key discussion points:

- The exclusion criteria - 2 days abstinent from cocaine - were included for reasons of medical safety. Participants were also excluded for any comorbid medical conditions that might be aggravated including various cardiovascular conditions, pregnancy, severe liver dysfunction.
- Most participants were poly drug users, however those who failed a urine toxicological screen for barbiturates or failed a breath alcohol screen were excluded.
- Previous work on the extinction of drug-related cues showed very small, specific effects, and the treatment took an extraordinary number of sessions, which is problematic as there are a large number of cues associated with drugs. Cue responses are hard to extinguish.
- If this approach works, it may potentially serve as an adjuvant to other therapies that have shown efficacy, and may be part of the treatment package.
- Drug addicts have been abusing beta-blockers a long time, especially those with comorbid anxiety disorders. Participants had different experiences with this.

Team in Transdisciplinary Studies in DWI onset, Persistence, Prevention and Treatment

Dr. Thomas Brown, Director and Principal Investigator - Addiction Research Program
Research Centre of the Douglas Mental Health, University Institute, Douglas Hospital Research Centre

The work of Thomas Brown and his team is inspired by the terrible costs of DWI. Approximately 1.2 million people die each year as a result of DWI, with an additional 20-50 million injuries. In North America, more than one third of fatalities were associated with DWI, and in 2008, 1056 Canadians died from alcohol-related crashes. The economic costs of DWI are enormous. The reality of the situation is that this is a very complex problem, even more complex than some mental health disorders, involving an intersection of community values, economic aspects, legislation and policy. Dr. Brown's sees DWI as a process with terrible consequences, and the goal of his research is to try to find ways of interrupting this process.

Dr. Brown's overarching hypothesis is that persistent DWI reflects a type of risk taking behavior in a very pervasive context: driving a vehicle. He presented a diagram showing the psychobiological pathways to DWI, which maps the factors involved with increased DWI risk. They identified a subgroup of drivers whose responses to a psychosocial risk stressor (as measured by cortisol, a good marker that is not as vulnerable to distortion as questionnaires) decreased as the number of DWI increased. This relationship was a very powerful one, especially among recidivists, and dwarfed all the other associations and measures. They analysed the low responding subgroup and find that they are characterized by low academic achievement, problems with impulsivity, more criminal arrests, risk taking behaviour, smoke more cigarettes.

Dr. Brown demonstrated a paradigm of cognitive pathways to DWI, which defines some of the characteristics of this population and elements at play in DWI risk. He described some of their studies work showing a relationship between the severity of impairment and frequency of past DWI studies

using the Iowa Gambling Task to define a cognitive marker of a high risk subgroup, he examined gender differences in cognition, and studied executive control function differences between female and male offenders. The overarching goal of this work is to try to define the different DWI subtypes and to develop interventions that will work with each group.

Dr. Brown then described some of their preliminary work in intervention: what can be done to reduce DWI risk? For this, they wanted to design a powerful, brief (20-30 minute) intervention for the most malignant subgroup of offenders, the ones most unlikely to show up in a remedial environment. These participants were not interested in treatment but money, and were recruited through newspaper advertisements. During interviews, the interviewers "rolled with resistance" to steer them in conversation about inconveniences and eventually the consequences of their drinking and driving including fines, family relationships and other problems. The main finding was that recidivists who had brief motivational interview had a 25% decline in risky drinking days, versus those who had more of an evaluation interview. Those with the least motivation benefitted the most from the intervention; younger, males, who suffered more negative consequences of substance use, and were less committed to change. The different subgroups - which can be identified using psychobiological, cognitive and psychosocial markers - do not think the same way, and interventions need to be tailored for the subtypes.

Dr. Brown described some of his future work, intended to address the highest group of young drivers - novice drivers under the influence of peer pressure and alcohol, as well as novice drivers confronted with on-board alcohol detection technology after consuming alcohol. To improve the capacity for this type of work and to create a more realistic paradigm, they have created an amazingly high-resolution simulator that recaptures the experiences, noises and cues of driving a vehicle. As a result of their increased capacity, they have attracted many new team members, are engaging in new collaborative projects both nationally and internationally, and have recruited two international post-doctoral fellows and two Master's students. Since 2009, the lab's academic productivity has accelerated. To conclude, road traffic safety and DWI is a viable venue for transdisciplinary research, innovation, KTE, student training and saves lives.

Key discussion points:

- Although distracted driving is a big problem, this is not within their field of research; their focus is on driving impairment due to consumption of psychoactive substances. Discussion focused on the coupling of different combinations of alcohol and drugs and fatigue and peer pressure.
- They are looking at psychoactive prescription drugs such as pain relievers, with and without alcohol. They have information about medications and other compounds that drivers have divulged to them.
- Hardcore recidivists do poorly on the Iowa gambling task, but symptoms are different than those who classically fail this task. They don't care or like the negative consequences.
- There are probably many varieties of life experiences and genetic components that lead to people driving while intoxicated; social context, social support networks and friends may all be important moderators.

- Participants agreed that these were impressive results from such a short intervention. Although good minds have been working on this problem for decades, results were only seen when this team exploded the box and introduced technology from addictions research.

Closing remarks

Dr. Natalie Gendron

In closing, Dr. Gendron summarized some of the reasons for the meeting and future directions for the Institute. INMHA is committed to the concept of the Canadian Clinical Intervention Network in Addiction, but is cognizant that it takes time and effort to build a viable research strategy. For this reason, we need to be prepared and have a plan to push for continued funding.

Dr. Gendron asked participants if the Catalyst Grant program is an initiative that is worth renewing. Participants responded that Catalyst Grants are essential to allow important work around illicit drug use.

- Researchers liked the flexibility of catalyst grants, as they could submit innovative research that wouldn't have been appropriate for an operating grant.
- One researcher was able use the grant to obtain necessary equipment, because there are no restrictions on use of funds within the categories of eligible expenses.
- The Catalyst Grants gave researchers a chance to do something that they didn't have enough preliminary data to pursue, giving them the opportunity to move in a different direction with their research.
- The Catalyst Grants are seen as an important way of funding proof-of-concept work. While charities often will fund proof-of-concept work, there are few charities in the substance abuse area.

Dr. Gendron asked participants what they wanted from INMHA and replies were as follows:

- More direction about where to go obtain additional funding from CIHR after the Catalyst Grant;
- Longer term operating grants;
- More initiatives that target research on addiction;
- Stability, in the form of a longer-term commitments with a network program.

Dr. Gendron encouraged participants to fill out their Catalyst Grant final reports to describe the short, medium and long-term impacts and outcomes of the program. This will demonstrate what type of innovative and interesting work can be achieved with funding, and emphasize the positive outcomes of continuing the funding.

To conclude, Dr. Gendron thanked all the participants for attending the meeting. The presentations were wonderful, and demonstrated a wide range of research and impacts, notably impressive given the short duration and limited funding. She wished all attendees great success in their work and safe travels home.

Part 2: Breakout Sessions - Canadian Clinical Intervention Network in Addiction

INMHA has been working with the National Institute of Drug Abuse (NIDA) with the intention of developing a Canadian Clinical Intervention Network in Addiction (CINA), similar to the NIDA Clinical Trial Network (CTN). The purpose of the breakout sessions was to stimulate discussion and to solicit feedback and ideas from the community around the concept of a Canadian network.

Dr. Gendron set the context for discussion by describing some of the features of the NIDA CTNs and how a Canadian network will differ from this model. Unlike the US, where there are different NIH institutes dedicated to these areas, INMHA would not distinguish between alcohol and drug addiction and include all types of addictions such as tobacco and gambling. CINA will be built on Canadian studies and innovations, to address Canadian issues and populations. It will focus not only on treatment but on prevention as well as intervention at many stages.

The focus of the network is on treatment outcomes and the development of new and innovative strategies. The point of the network is to take treatments through all phases of testing to full implementation or service delivery, to improving lives with better services. It is not meant to be the creation of a comprehensive national strategy on addiction.

INMHA anticipates that CINA will start with a maximum number of three to four nodes, with the ability to expand with time. By necessity, the Canadian nodes will include a broader geographical distribution and a wider geographical catchment than the US nodes.

At each of the breakout sessions, participants broke into three groups to discuss specific questions. There was much overlap in the responses from the different breakout groups, which are captured below.

What are the important areas/population/topic foci that should be included in a Canadian Clinical Intervention Network in Addiction?

Studies in "Real Life" client populations: poly drug users and those with co-occurring mental health disorders.

- We have an opportunity to demonstrate good research on complex patients: this "non-clean" population reflects the reality of the epidemiology of substance abuse.
- In patients with co-occurring disorders, will targeting the mental health issue serve as a prevention strategy for substance abuse?
- Much of the previous research in this area involves interventions on "pure" clients who have only one disorder. NIDA only funds addiction, and NIH only funds mental health, which is a problem when it comes to obtaining funding for research on concurrent disorders.
- Psychiatric patients are often excluded from studies. Are these patients excluded for methodological reasons or for feasibility issues?
- One caution: we don't want to gain a reputation as having the nodes with the "messy" participants, or none of the NIDA researchers will want to recruit in Canada.

Translating or adapting research-based treatments into real world situations

- How do we maintain the integrity of researched-based interventions? Should we be concerned that their deployment is weaker in the real world?
- What is the interaction between evidence-informed treatments and individual or community characteristics? How are treatment outcomes influenced by culture, age and rural/urban environments?
- How can we provide front line care providers with good evidence-informed practice about interventions? Do we force clinicians to implement these treatments exactly, or not?
- Suggestion: have research associates work with clinicians to help document current processes to determine "what is working". This validates their approach and allows new protocols to be tested and measured against 'treatment as usual'.

Validating existing studies in the Canadian context

- Replicate many of the existing studies with respect to early stage substance misuse and the involvement in the front line of detection and brief interventions in Canada.
- The Canadian medical /health delivery reality is very different from the US; there is something new to be learned in the Canadian environment.

Identification and development of better therapeutic interventions

- The definition of therapeutic intervention needs to stay as wide as possible and needs to encompass more than just pharmaceuticals.
- This topic needs to specifically focus on Canadian discoveries and interventions.
- We need to take a harm reduction approach and address the areas of greatest harm including DWI and injuries.
- Development and testing of detection and brief intervention technology that can be well deployed in the front line to encourage induction into treatment under different circumstances. One specific area mentioned was early stage alcohol and drug abuse, which is an area that is difficult to implement in primary healthcare.
- What is the best time to intervene? Is it different for each population?

Prevention needs be integrated as a general cross-cutting theme in all of the nodes.

- The network should perhaps remove <clinical> from its title to include prevention, which is not clinical.

Impact of legal policy with respect to population health.

- What is the impact of criminalizing people using substances, and how does this influence access, retention and outcomes of treatment?
- What treatment services are available to support the drug courts?

Evaluation of existing programs

- Evaluate interventions in the real world situation to determine if they are working.
- Are prescription opiate abuse monitoring programs working?

- Is telehealth a viable alternative to providing intervention and care in rural communities and for hard-to reach populations?

Defining and standardizing phenotypic measures

- Develop defined phenotypic measures as outcomes.
- Establish a standard protocol and core measures to use from one study to the next.
- Correlate personality measures (an objective measure of behaviour/emotion/cognition) with biological measures.

Identifying new neurobiological treatment targets, specifically in the intermediate area of transition to addiction.

- Are there ways to identify who will progress to addiction?

First Nations: this is a priority population and may need its own node.

Focus on the highest risk groups

- The network needs to encompass a life scan approach from children to the elderly.
- Adolescents and young adults (15-25) are the most at risk group, and need to be the focus of treatment and prevention approaches: initiation in youth, secondary prevention in young adults.
- In aging populations: alcohol problems in current cohort, other substances may come into play as the cohorts are moving.
- Aging populations and prescription medications.

A focus on vulnerable populations

- Incarcerated people that are being released.
- Women during reproductive period.
- Risk takers: usually a sign of abuse and a predictor of addiction.
- Risk behaviour, genetics as a factor of risk, exploring the concept of the risk environment (i.e. if a community problem is the cause, then you need to do a community intervention).
- Post Traumatic Stress Disorder.
- A node on risk factors instead of vulnerable populations.

Tailored gender-specific interventions focusing on harm reduction

- Transition to fatherhood as an opportunity for smoking cessation.

Pregnant woman and treatment of addiction

- There is no real data in this area besides methadone treatment.
- This may be very different than in the general population.
- Basic safety and efficacy studies needed for use of buprenorphine in pregnancy.
- Existing interventions for pregnant women are based on the health of the fetus.

Other priority topics:

- Examine demographic differences (age and gender) and interactions with drugs of abuse and treatment interventions. There may be particular interactions between these factors and substances being used.
- Fast action plan around early intervention and the risks associated with it.
- Stimulant substitution.
- The epidemiology of abuse of legal substances. To what degree are people exposed to, or are using legal substances?
- Stratified medicine that aligns an individual with the most effective intervention for them, but avoiding giving someone a drug with high potential for side effects.
- Late stage addiction.
- Focused work on methamphetamine users.
- Prescription opiate abuse, which includes many different treatment options. As First Nations communities have high prevalence of opioid abuse, specifically and systematically focus on this population.

How do we determine where the nodes are located?

There was much discussion about the best locations for the Canadian nodes, and whether the locations should be determined by geography, by expertise or by population. While an absolute consensus was not reached about where the specific node(s) should be located, there seemed to be the most support for nodes being established around pre-existing expertise.

Nodes based on expertise

- Initially, the nodes must be established around the clinical trials and addictions capacity that currently exists in Canada, as this is the easiest road. These nodes can coordinate trials across Canada.
- Cities with pre-existing expertise include Montreal, Ottawa, Toronto (CAMH), Vancouver, Hamilton (McMaster), Halifax (Dalhousie). Alternatively, regional nodes could be established in Western Canada, Central Canada and the Maritimes.

Nodes based on populations

- Geographic selection will, by necessity, be influenced by the location of populations.
- It makes sense for some nodes to specialize on certain topics/populations.
- Different geographical nodes can address different priorities based on drug use patterns in those areas in order to have direct access to patients. For example, a Vancouver node can focus on injection drug use, and Vancouver, Ottawa and Toronto are all centres for stimulant substitution.
- A Northern node will need to bring expertise to the area. Although there is minimal research/academic expertise located geographically, there are physicians and nurses who work in the area who can be recruited to be part of the network.

Support for one national node

- Because there is far greater exchange of information when people are in close proximity, creating one national node that emphasizes face-to-face activity may be best for establishing collaborations and for delivering effective interventions.

Do you see any barriers to the establishment of a national network in the Canadian context?

A key challenge will be finding the unique balance for a Canadian network that interacts with NIDA; although the Canadian nodes would benefit from this opportunity to interface with the larger and well-established NIDA network and be part of large NIDA protocols, the Canadian network needs to focus on Canada's best interests and respond to the needs of the Canadian population. Other challenges/barriers that were identified included:

- Geography, language and culture are major barriers in the Canadian context. We have a huge country, with a small number of people. How do we construct a network that reflects the reality of both concentrated and dispersed populations and will address specific challenges: regional challenges, demographic challenges, cultural challenges?
- Challenge of reaching rural/Northern populations. This is germane when dealing with Native Peoples up north.
- Distance between researchers is a problem in multi-site studies.
- Bringing together the different types of hospitals and triage centres and treatment centres to work together.
- Youth programs don't exist across the country.
- Lack of funding.
- No stability.
- Ethics may be challenging.
- Interventions that work in the lab are not always translatable to real-world situations.
- Fragmentation and a problem of jurisdictions. One example is the localization of methadone programs to BC and Ontario.
- Shortage of clinical research units.
- Treatment centres are poorly funded, short in staff and have long waiting lists.
- Lack of collaboration between treatment centres and researchers. Lack of liaison on the ground with stakeholders.
- For many clinicians, there is no culture of research or formalizing their protocols. Many clinicians don't write about what they do, they just do it
- Challenge is working with the different provinces; all of the provinces are cautious about maintaining autonomy.

What are the advantages and assets of hosting this in Canada? What are our strengths?

- We have a systematic way of accessing the post-high school population when the transition to addiction typically happens. In the US, the only way to study young adults is in Colleges. In Canada we can access these people through primary care, and to study them more easily.
- There is a strong tradition in Canadian addiction research for high-risk research.

- Canada has strong traditions for recruiting from the community.
- We have more room for individualized approaches or individualized treatment strategies.
- We have a stronger focus on trajectory, risk profiles and potential for interventions than the US.
- The community is small enough that we could have highly integrated nodes to increase the numbers of subjects in each study.
- We have good standards of care around alcohol and cannabis and excellence in cocaine addiction research.
- Basic neuroscience is strong in Canada, as is comorbidity and substance abuse work.

What are the elements needed for the Canadian Clinical Intervention Network in Addiction to be successful? (e.g. Research Capacity, Treatment infrastructure, etc)?

All groups recognized that we have an enormous opportunity ahead of us, but this will not be easy.

Network deliverables will need to be clearly identified from the start.

- We will need to clearly define a timeline for when the benefits will be tangible for Canadians.
- This is the type of argument required to convince politicians.

Strong translational elements are required to minimize gap between available research and research landing in the clinical practice.

- Key players must be in place to facilitate translation of research to therapeutic outcomes, to facilitate their adoption in a clinical setting.
- There are opportunities in terms of dissemination and deployment of knowledge in Canadian health scene.
- Consider cultural aspects for knowledge transfer; information will need to be disseminated/ absorbed in very different geographical, cultural, professional environments, and messages have to be tailored.

Alignment of clinical trials expertise with addictions

- The nodes must align with good clinical trial units that not only provide necessary services, but will also ensure that trails are conducted to a high standard of quality and consistency.

Strong integration of university centres with community treatment centres

- Impose university-based nodes onto services. However, the funds can't all go to university, but need to support the treatment centres.
- Treatment centres have the ability for community recruitment of substance abusers, which is a way to reach high-risk populations.
- There needs to be some incentive for service providers to participate.
- Part of the infrastructure would have to include teaching hospitals that would be able to address all the requirements of the trials. Teaching hospitals have most of the resources needed to tackle the more challenging areas where the real gaps exist. These centres are the only ones that would pass an FDA audit.

- Treatment centres need to be located in places that are central and accessible to drug using populations, and they need to have a mechanism of follow up.
- There may be different roles for different types of treatment centres - both the rehabilitation centres that are not funded publically as well as the ones that meet national accreditation standards.
- The treatment centres need to be a major focus of this trial network, which needs to include more than just the isolated academic settings where research is conducted.

Need to establish relationships between all the institutions/hospitals.

- A structure on paper doesn't mean relationships; we need to go out and build the necessary relationships.
- Strong collaborations between treatment providers and researchers are necessary.
- We need to establish close connections with service providers in each geographic region.
- Recognize that everyone has different priorities and ongoing research projects, and are struggling to provide care. There needs to be incentives for people to participate.
- The CEO of the teaching hospitals need to come on board, they will ultimately say what they want in each hospital, determine requirements in hospital.
- If you have research agents embedded in clinical setting, you can avoid a lot of hassles of buy -in.

Need to identify and include all the necessary groups and have a way to bring them together

- Establish links with all correctional services - both at Federal and Provincial levels.
- Involve Provincial government decision makers.
- Need to build a network involving the health authorities and local communities, so that interventions developed in one centre can be tested in communities.
- Health authorities.

Need to find a way to reach hard-to-reach populations and communities.

- Need to plan for physical facilities or mobile units attached to a node to go out and reach populations in small communities. This may be the way of the future.
- Need to create the capacity to conduct a study in rural areas.

Strong leadership is required

- This whole endeavour requires a leader.
- Convene a steering committee with academics, knowledge users and clinicians in the field to determine the critical questions.
- The leadership needs to promote synergy between all the stakeholders and to remove competition between researchers.
- A peer review process needs to be established for identifying achievable goals and putting resources in the right areas.
- A specialist in governance needs to be included.

A strong ethics component is necessary

- Need a way to coordinate ethics across all fields.
- Need to see how multi-site trials in other medical fields are conducted.
- The Research Ethics Board is not a barrier.
- Hospital ethics committees have experience in evaluating multi site trials.

Create multidisciplinary teams and sufficient resources

- We need to include addictions psychiatrists, research nurse coordinators, basic researchers, trialists, program evaluators.
- We need people in dedicated positions who can liaise with stakeholders.
- All levels of analysis need to be included.

Other elements that were identified as being necessary:

- Graduate programs in psychiatry and training to cultivate specialized expertise in the area of addictions research.
- Ongoing evaluation.
- Participatory element on behalf of the drug user community.
- Need enthusiasm, and a "kick off project" to start it all.
- Need to have a common centre for data collection.
- Tap into existing and mature Canadian networks for sharing/synergy of services.
- We need to conduct studies with sufficient power.

What model should we follow/incorporate?

Participants in each breakout group recommended looking at a variety of pre-existing network models to find out what their strengths and weaknesses are. Instead of inventing the wheel or recreating the competencies, we need to determine who is doing what and how can we tap into this. We have opportunities to benefit from all the work that other groups have done, and there is much that we can share.

- We need to look to other models to see the nature of relationship between research and clinical spheres.
- We need to assess the accomplishments and failures of NIDA CTNs. They have a wealth of knowledge and experience in overcoming a lot of challenges we have been talking about.
- In addition to the NIDA CTNs, other networks or organizations that were mentioned as potential models are Canadian Cancer Clinical Trials Network, the Canadian knowledge translation networks, the CIHR Drug Safety and Effectiveness Network, and CAMH (Ontario).
- We need to see how CAMH (Ontario) is aligned with provincial services to facilitate and implement activities in the community.
- We can penetrate areas that are outside of the main city centres by liaising with community health services.
- There are compelling arguments for being part of a powerful pre-existing entity. Perhaps CINA could connect sub-nodes of an existing structure.

- We need to see what others have developed in terms of protocols and evaluation protocols.

Moving forward...what are the next steps?

Two of the breakout groups discussed the "next steps" for the Network, which needs to be established using a phased approach.

(1) Start with an achievable kick-off project to get things going.

- You can't create a network that is meaningful unless you have something that is happening; We need to chose a few early achievable goals to get things started right away.
- One option is to see what is upcoming in the US, so that you start with a project to test the network, but at the same time build the network.

(2) Determine existing structures and resources and how they are managed at a provincial level.

- We don't have an inventory of the infrastructure. We need to determine what resources we have and where they are located. What is the expertise of researchers in different areas? What community centres exist? What are the tertiary institutions/community centres in each province?
- We need to establish a database of expertise for researchers in different areas.
- Has there been has been a recent needs assessment in addiction /substance abuse research in Canada? This needs assessment shouldn't be conducted by a clinical trials network, as we don't want to take a step back to evaluation research.
- Start with an inventory of people who do everything and then how they relate to their community partners, then include the teaching centres.
- Look at opportunities to exploit existing infrastructure and networks to move this forward.
- Some participants felt that it would take a significant amount of time (2-3 years) to determine the structure.

(3) Establish relationships between all the necessary components, starting with institutions/hospitals.

- Need to bring people together face to face. Sit down together and come to terms to say "we want this to work" what are barriers, how we network and communicate.

Appendix 1: Agenda

Second Substance Abuse Prevention & Treatment Initiative Workshop

November 9-10, 2011
Hyatt Regency Vancouver, 655 Burrard Street, Vancouver, BC.

Wednesday November 9th (Day 1)

Time	Activity	Speaker
12:15 – 13:15	Lunch –	
13:15 – 13:30	Opening Remarks	Anthony Phillips
13:30 – 14:30	Presentations (2)	Amy Salmon Marvin Krank
14:30 – 14:45	Networking Break	
14:45 – 16:15	Presentations (2)	Stephane Potvin Jenny Cartwright
16:15 – 16:30	Networking Break	
16:30 – 17:30	Breakout Session Number 1	All

Thursday November 10th (Day 2)

Time	Activity	Speaker
07:30 – 08:30	Breakfast	
08:30 – 9:30	Presentations (2)	Alan Hudson Marco Leyton
09:30 – 10:30	Presentations (1)	Thomas Brown
10:30 – 10:45	Networking Break	
10:45 – 11:30	Breakout Session Number 2	All
11:30 – 12:15	Reports from Session Number 1 and 2	Group Rapporteur
12:15 – 13:15	Lunch – Indigo Room	
13:15 – 14:15	Future Directions	All
14:15 – 14:30	Concluding Remarks	Anthony Philips

Appendix 2: Attendees

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