Research focus

Study after study shows mental health is one of our most pressing social and economic issues. While 20 per cent of us will personally experience a mental health problem in our lifetimes, almost everyone is affected—directly or indirectly—by poor mental health.

Psychiatry researchers at Dalhousie University, Capital Health and the IWK Health Centre take a proactive approach to mental health issues, ranging from anxieties and behaviour problems in young children, to depression, bipolar and schizophrenia in adults. Because mental health disorders often emerge in childhood or adolescence, these researchers are looking for ways to intervene earlier in people's lives—in some cases, before they are even born.

This broad-based research effort involves professionals and trainees in the fields of psychiatry, psychology, social work, nursing, education, epidemiology, and more. It receives funding from such sources as the Dalhousie Department of Psychiatry, Capital Health Research Fund, Dalhousie Medical Research Foundation, Nova Scotia Health Research Foundation, Canadian Institutes of Health Research (CIHR), and National Institutes of Mental Health (US).

Mom's stress response in pregnancy: can it set the dial for baby's life?

Dr. Kathleen Pajer wants to know how much a mother's stress response during pregnancy—high, normal or low—impacts the development of her baby's stress response system after birth.

"It typically takes four months for a baby's stress response system to mature," notes Dr. Pajer, "so we will follow the babies in our study for at least this long." She and her team will measure how much the babies' heart rates change and how much cortisol they produce in response to stress—and compare these indicators of stress response to those they recorded in the babies' mothers while they were pregnant.


Dr. Kathleen Pajer

"We're particularly interested in the impact of a mother's low stress response on her baby, because children with a low stress response are more likely to have attention and behaviour disorders and less likely to respond well to criticism or learn from their mistakes," Dr. Pajer explains. "At the low end of the stress response scale, we see lack of empathy and deceitful or aggressive behaviour that can lead to serious social and mental health problems."

If the researchers find that babies of low-stress-response mothers do develop a low stress response, they will take the research to the intervention level. "We know stress response can be re-set through techniques like meditation and yoga," says Dr. Pajer. "We would want to know if this benefit can be transferred to the baby, in utero, to set them up for a happier, healthier life."

Dr. Pajer is a professor of psychiatry at Dalhousie Medical School and head of Child & Adolescent Psychiatry at the IWK. In addition to her work with moms, babies and stress, she's developing a blood test for detecting and diagnosing early-onset depression.

psychiatry

Sleep: essential ingredient of mental health

Sleep and mental health researchers at Dalhousie University, Capital Health and the IWK Health Centre are learning just how important our nightly sleep is to our daily mental and emotional states and ability to function.

Better nights make better days for children


Dr. Penny Corkum

Children are especially vulnerable to the effects of too little sleep. "We've found that losing even one hour of sleep has a significant negative impact on children's ability to pay attention, to learn, and to regulate their emotions and behaviours the next day," says Dr. Penny Corkum, a professor, clinician and researcher. "We also found that sleep loss muted children's positive responses to appealing images, like puppies and ice cream, compared to well-rested children."

These findings applied to healthy children with no mental health problems—although they suggest that ongoing sleep loss could have serious cumulative effects on mental health over time. Dr. Corkum suspects sleep may play an even more crucial role for kids with ADHD (Attention Deficit Hyperactivity Disorder). She and her colleagues are studying how stimulant medications commonly prescribed for children with ADHD may affect the duration and quality of their sleep, and how more or less sleep interacts with medication to impact daytime functioning.

Knowing the negative effects of sleep loss on children is one thing—doing something about it is another. That's why Dr. Corkum is leading a massive CIHR-funded intervention study called Better Nights, Better Days. The study, which involves a network of researchers across the country, including Dalhousie colleagues Drs. Ben Rusak, Christine Chambers, Patrick McGrath and Pantalis Andreou, will eventually enroll 900 families.

"We're developing an evidence-based online intervention to help parents learn how to support better sleep for their children," Dr. Corkum explains. "If it proves to be effective, we aim to make it available to all parents in Canada."

Sleep, physiology and mood


Dr. Ben Rusak

Professor and sleep researcher Dr. Ben Rusak is deeply interested in the interplay between sleep, physiology, mood, stress, cognition and mental illness. "Abnormal sleep is common in psychiatric conditions," notes Dr. Rusak. "Disrupted sleep is seen in patients with depression or psychotic disorders, and excessive sleep may occur in a subset of depressed patients."

Among many studies, Dr. Rusak and his student, Amanda LeRoux, are exploring how sleep disruption affects hormonal rhythms—particularly of the stress hormone cortisol—and appetite in healthy young women at various points in their menstrual cycles.

He is also collaborating with psychiatrist Dr. Abigail Ortiz to compare the sleep cycles of people with bipolar disorder to those of people with no mental illness. "Shortened sleep may signal an impending transition to a manic phase," Dr. Rusak notes. "Learning more about sleep in bipolar disorders provides another tool to help manage the disease."

Early intervention in action

Researchers in the Centre for Research in Family Health at the IWK, led by Drs. Patrick McGrath and Patricia Pottie, have developed Strongest Families to deliver mental health services to families in the comfort of their own homes. Now a free-standing institute, Strongest Families effectively addresses mild to moderate anxiety and behaviour disorders in children using educational modules and telephone coaches. Meanwhile, IWK psychiatrist Dr. Normand Carrey has CIHR funding to investigate the feasibility of embedding mental health interventions for at-risk children into early childhood education programs.

Heading off mental illness: early intervention research aims to keep young people healthy

As a psychiatrist who works with adults in the throes of severe mental illness, Dr. Rudolf Uher has often been struck by the feeling that if only these patients could have received help earlier, they might be doing much better. That's why he's shifted his research focus to early intervention.

"We now know that mental illness follows a more predictable course than we had previously thought," says Dr. Uher, a psychiatrist at Capital Health, associate professor of psychiatry at Dalhousie, and Canada Research Chair in Early Intervention. "We know it runs in families and that there are hallmark signs we can identify at an early age... what we need to learn now is, can we alter the course?"

To answer this question, Dr. Uher has launched the FORBOW study— Families Overcoming Risk and Building Opportunities for Wellbeing—funded by CIHR and Nova Scotia Health Research Foundation.

Dr. Uher is collaborating with child and adult psychiatrists at the IWK and Capital Health to identify children and youth between the ages of three and 21 who are at risk of developing serious mental illness. "We know they're at risk because they have a parent or other close relative with a serious mental illness such as bipolar disorder, psychosis or severe depression," he says. "Ultimately, we aim to involve 300 families in the study."

Mental health nurse Jill Cumby and psychologists Lynn MacKenzie and Jessica Morash are working with Dr. Uher to assess the children and youth and to work with those who show early signs of risk. These include seemingly small problems—such as anxious feelings, an inability to handle frustration, a tendency to outbursts, or a lack of persistence—but they can snowball into bigger problems and, eventually, mental illness. Children who have unusual experiences, such as seeing or hearing things that other people do not see or hear, can be at risk of developing psychosis—particularly if a parent has the illness and if they allow these experiences to assume too much significance.

Dr. Rudolf Uher and (front, l to r) Jill Cumby, Lynn MacKenzie, Jessica Morash

"We will work directly with children and youth, teaching them how to manage their thoughts and feelings," notes Dr. Uher. "We'll also work with parents, especially of the younger children, to teach them effective parenting techniques that result in less stressful daily interactions. I believe that we CAN foster resiliency and change the course of young people's lives by providing families with these skills."

Resources and programs from the Sun Life Chair:

- **Well-beings: Nova Scotia Mental Health Framework**—strategy document that embeds mental health in the NS education policy, 'Kids and Learning First'
- **Teenmentalhealth.org**—comprehensive website and resources for teens, families, educators and health professionals
- ***Parenting Your Teen*** **and** ***Teening Your Parent***—companion books to foster positive communication and help parents and teens understand teen mental health
- **Transitions**—an e-book, book and app to help grade 12 and first-year university students manage mental health issues related to the transition from high school to university
- **'Go To'**—a program that trains 'go to' teachers and guidance counsellors how to recognize potential problems and provide preliminary assessments and referrals
- **Primary care capacity building**—training programs designed to improve the ability of primary care providers to identify, diagnose and treat mental disorders

Sun Life Financial Chair puts adolescent mental health on the map

Mental health is now firmly embedded in Nova Scotia's school system—thanks to the leadership of Dr. Stan Kutcher, Sun Life Financial Chair in Adolescent Mental Health, and the enthusiastic support of government and school board officials, teachers, parents, health professionals and many others across the province.


Dr. Stan Kutcher

"We know that 15 to 20 per cent of young people suffer from mental disorders," notes Dr. Kutcher, a professor, psychiatrist and leading world expert in adolescent mental health. "School is the place to reach them before their problems become serious."

Dr. Kutcher and his team are working with many different partners to develop, test, refine, implement and evaluate training programs and educational materials that cover the critical years from junior high to university, and to put systems in place so problems are recognized early and kids are referred to the appropriate services.

"We've approached teen mental health from every angle, creating materials about how to achieve and maintain mental health, how to manage mental health risks, how to recognize mental disorders, and how to get help—for teens themselves and for parents, teachers, and guidance counsellors," Dr. Kutcher says. "From there, we've launched 'train the trainer' sessions with educators in every school board in Nova Scotia, so each board now has mental health experts who can provide their colleagues with the knowledge and tools they need to effectively teach the mental health curriculum we've developed."

Dr. Kutcher is also working with colleagues in Ontario, BC, Portugal, Brazil, Malawi, Zambia and other countries to test the effectiveness of these school-based mental health promotion and mental disorder prevention and early intervention programs. Knowledge gained through these studies is applied in NS as well as the partner provinces and nations.

At the same time, Dr. Kutcher and his team are striving to build health care systems' capacity to help young people with mental disorders. They've embarked on research projects in BC and NB to determine how best to improve the ability of family physicians, nurses, nurse practitioners and other primary care providers to recognize and diagnose mental disorders and provide effective first-line treatments. "We're transforming the landscape of teen mental health, removing obstacles of stigma and creating new pathways to care," he says. "The results so far have been outstanding."

Dr. Alexa Bagnell

Protecting kids from the effects of stress

Everyone feels stressed at times and kids are no exception. In fact, children and teens are highly vulnerable to stress, whether it's caused by problems with schoolwork, friends, family, being bullied, or feeling like they don't fit in.

"Stress is an important mental health issue for young people," says Dr. Alexa Bagnell, associate chief of psychiatry at the IWK and associate professor of psychiatry at Dalhousie. "As stress from different sources accumulates, it can precipitate mental health problems—especially in kids who are already susceptible."

Dr. Bagnell wants to help kids build their abilities to shield themselves from the negative effects of stress, by learning to recognize and positively cope with stress. She and her colleagues have designed a stress workshop for junior high school students that uses fun and games to teach kids how to manage the stress in their lives, how to know when the stress is too much, and how to get help. They also run workshops about bullying and positive self-talk.

In addition to taking part in workshops, students can log on to *My Health* magazine, an interactive e-zine Dr. Bagnell has developed with colleagues at the University of Ottawa. "Kids fill in surveys on the website about what components are most helpful for them," she notes. "We're also using the website to see how much they're learning from the workshops, by asking them to complete online surveys before and after. It's proving to be a very useful and successful tool."

Surprising links between smoking, smell and psychosis

For reasons researchers don't yet understand, most people with psychotic disorders smoke tobacco. Associate professor and researcher Dr. Kim Good has teamed up with colleagues to learn more about the visual cues that trigger tobacco cravings. "We're using functional MRI to see what areas of the brain change their activity levels in response to videos showing such cues as other people smoking," explains Dr. Good. "We're doing this with smokers, ex-smokers and non-smokers, including people with psychosis."


Dr. Kim Good

The researchers want to identify pathways in the brain that produce the feeling of reward associated with smoking. "If we can teach people to recognize the visual cues, we may be able to modulate the activity of the reward pathway and help them overcome their addiction," Dr. Good says.

Sense of smell may or may not have anything to do with cigarette cravings in people with psychotic disorders—but sense of smell itself is definitely significant in psychosis. "About a third of all people with psychotic disorders also have a disordered sense of smell," notes Dr. Good. "They have a very hard time correctly identifying smells."

Dr. Good and her team have also found that people with a disordered sense of smell don't do as well on anti-psychotic medications as those whose sense of smell is normal. "This means that deficits in sense of smell could be a powerful predictor of treatment response in psychosis," notes Dr. Good. She and her colleagues have been studying the use of a smell test that could help clinicians sort out which patients will need more support—and perhaps a different approach to treatment to do well.

A multi-pronged approach

Researchers in the Nova Scotia Early Psychosis Program aim to reduce the toll of psychosis. They collectively hold nearly 30 grants to study:

- the genetics and neurobiology of psychosis
- barriers and pathways to care
- novel means of assessing and subtyping psychotic disorders
- effectiveness of various therapies, including art therapy
- mindfulness meditation as way for family members to cope
- long-term outcomes

New approaches to psychosis give hope for better outcomes

Psychotic disorders come in many forms, from many causes. People experiencing psychosis may see or hear things that other people don't see or hear, and hold beliefs about the world that other people don't share. Typically emerging in young adults, psychotic disorders often persist and interfere with the ability to form relationships, perform at school or work, and function in day-to-day life. Dr. Philip Tibbo wants to prevent such devastating outcomes through early identification, new approaches to treatment, and downright avoidance of powerful triggers.

"Some people are 'wired' to be susceptible to psychosis, but it's not inevitable," says Dr. Tibbo, director of the Nova Scotia Early Psychosis Program and Dr. Paul Janssen Chair in Psychotic Disorders. "We believe mental health can be protected by avoiding triggers—such as excessive stress, lack of sleep, and street drugs, especially cannabis."

Cannabis use at a young age dramatically increases the risk of psychosis. Dr. Tibbo and Dr. Jacob Cookey, a psychiatry resident in Dalhousie Medical School's Clinician Investigator Program, are examining the effect of cannabis on brain development and social outcomes of young Nova Scotians. "We're using multiple neuroimaging techniques to see what's happening to specific brain regions and the overall structure of the brain, based on what age they started and how often they use, and to compare this to the brains of kids who don't use," explains Dr. Tibbo. "We want to know what is the nature of the damage and how it might set them up to develop psychosis."

Dr. Tibbo and Dr. Denise Bernier are meanwhile conducting neuroimaging studies to see how white matter in the brains of young people with psychosis differs from that of people the same age who do not have psychosis. White matter is the neural "connective tissue" that links the various regions of the brain. "Early psychosis may be due to a white-matter problem that prevents the proper relay of signals in the brain," notes Dr. Tibbo. "This means it could potentially be treated with something that protects or repairs the myelin sheath encasing the white matter."

Bipolar disorder: genetics, lithium and mitigating risk

Capital Health psychiatry researchers are combining brain imaging, molecular genetics and clinical studies to reveal the mysteries of bipolar disorder and shed light on powerful new ways to reduce the impact of the disease. "The puzzle pieces are coming together, but it's a complicated picture," says Dr. Martin Alda, psychiatrist, professor and Killam Chair in Mood Disorders. "There are many shades of bipolar disorder, with widely variable responses to treatment."


Dr. Martin Alda

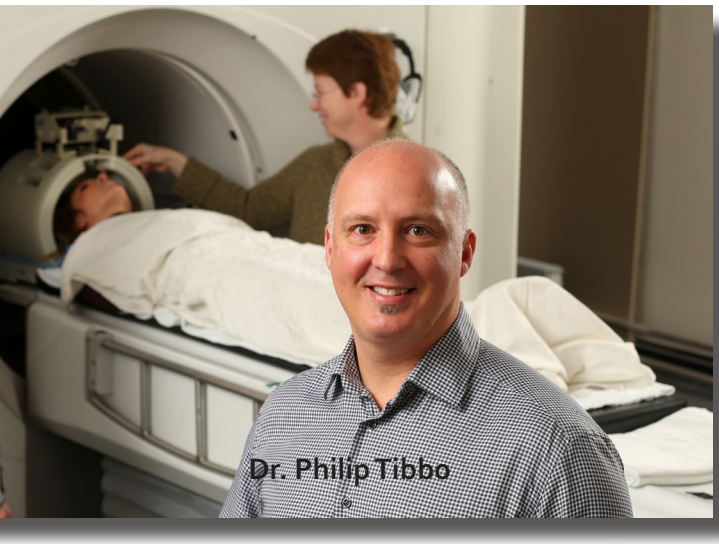
Lithium is the most widely used and effective treatment for bipolar disorder, but not everyone responds. This has important implications for suicide risk, as Dr. Alda and his collaborators recently discovered in a study of nearly 5,700 people in 737 families with bipolar disorder. "We found that genetic factors accounted for much of the suicide risk and that lithium treatment reduced the risk of suicidal behaviour for many people," he says. In another study, Dr. Alda and collaborators in Italy have identified a gene that could be used as a marker of suicide risk. Although this gene can normally be regulated by lithium, it did not respond to the treatment in the same way in people with bipolar disorder who died from suicide.

In addition to these studies, Dr. Alda is principal investigator of a CIHR-funded study of lithium response involving international collaborators and 3,000 people with bipolar disorder. The researchers are looking for subtle molecular variations in participants' genetic profiles that might predict their response to treatment. "We're comparing each person's clinical profile—in terms of history and response to treatment—to their molecular genetic profile to learn how to better recognize and treat each sub-type of the disease," he explains.

Because having a close relative with bipolar is a prime risk factor for the disorder, Dr. Alda and his colleagues are studying the children of their adult bipolar patients. In brain imaging studies, psychiatrist and associate professor Dr. Tomas Hajek has found that an area of the brain known as the right inferior frontal gyrus is abnormally enlarged in children with a family history of bipolar. The researchers have also found that the same area of the brain decreases in size as the disease progresses, but that lithium protects it from deterioration in people who respond to the drug.


Dr. Tomas Hajek

"We're learning more and more about how we can predict who's at risk of developing the disease, who will and will not respond to lithium, and who may try to commit suicide," Dr. Alda notes. "This will allow for much more effective customized treatment and potentially even prevention of the disorder in young people at risk."


Dr. Philip Tibbo

A brief form of talk therapy yields promising results

Researchers in Capital Health's Centre for Emotions and Health are world leaders in the study and application of a relatively new kind of talk therapy called "intensive short-term dynamic psychotherapy" (ISTDP). Unlike cognitive therapies, which focus on thought patterns, this technique prompts people to rely less on their customary defences so they can experience and work through avoided emotions.

"A range of problematic health and illness behaviours develop when anxiety-provoking emotions get blocked," notes Dr. Joel Town, an assistant professor at Dalhousie and clinical psychologist in the Centre for Emotions and Health. "In ISTDP, we quickly establish a trusting relationship and help people to process these feelings."

Led by psychiatrist and professor Dr. Allan Abbass—and with pivotal funding support from a private donor, Capital Health and the Department of Psychiatry—the researchers have found that ISTDP is an effective way to help people suffering from depression, personality disorders, chronic headaches and other problems. They've also found the method delivers savings to society through reduced disability, use of medications and visits to doctors' offices and hospitals.

Treatment-resistant depression

Now the researchers are exploring how well ISTDP works to resolve treatment-resistant depression. "About 60 per cent of people with severe depression do not respond to first-line treatment, which is the first medication prescribed to them," explains Dr. Town. "Of the 40 per cent who do respond, up to a third will relapse." This leaves a lot of depressed people, who typically end up trying numerous medications with less-than-satisfying results.

Dr. Town is lead investigator of a three-year CIHR-funded study that randomly assigns treatment-resistant depression patients to 20 weekly ISTDP sessions or to traditional treatment provided by secondary care mental health services. "We want to know if ISTDP will render strong and lasting positive results, compared to the typical therapies used for people who aren't responding to medication," says Dr. Town. "If this is the case, this offers a rationale for referring people to talking therapy much sooner, before they've failed multiple medications."
The researchers will also examine the cost effectiveness of treatments and attempt to isolate the "active ingredients" of ISTDP, and which aspects of the therapy work best for which kinds of people. Says Dr. Town: "We're looking to both optimize and customize the treatment delivered."

Centre for Emotions and Health research team (l to r), Dr. Allan Abbass, Dr. Denise Bernier, Dana Jackman and Dr. Joel Town

Medically unexplained symptoms

At least one in six visits to Capital Health emergency departments is due to symptoms for which no physical pathology can be found—including eight of nine for abdominal pain and three of four for chest pain. Typical emergency care systems are not equipped to deal with medically unexplained symptoms, so these patients leave the hospital with no idea of what's causing their symptoms.

Research conducted by Dr. Abbass and Dr. Sam Campbell, chief of the emergency department at Capital Health, has shown that many people with medically unexplained symptoms can be helped with ISTDP. As a result of these findings, they've established a clinic for people with medically unexplained symptoms in the emergency department at the QEII Health Sciences Centre. "Now we can provide meaningful treatment to people who would not receive help otherwise and might even find their symptoms becoming worse,"
Dr. Abbass says. "This saves repeated unproductive visits to doctors' offices and emergency departments and lets people move on with their lives."

Research Services produced *Research Focus on Psychiatry* in the spring of 2013. For further information, call 902.473.7906.
Melanie Jollymore, writing; Emily Walker, design; Gerard Walsh, John Sherlock, Nick Pearce, photography