



PERSONALIZED MEDICINE

In Your Sponsored Health Plan

Employers Handbook



**personalized
prescribing**
next gen pharmacogenetics

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Pharmacogenomics

Using genetics to save time and reduce costs

Mental Illness is a Major Issue in the Canadian Workplace

Mental illness affects all workplaces results in significant economic losses due to presenteeism (loss of productivity), absenteeism and disability.

According to the Ontario Chamber of Commerce, The cost of mental illnesses to the Canadian economy is estimated at over \$50 billion annually, with \$20 billion of that stemming directly from workplace losses.

On average, mental health issues cost businesses almost \$1,500 per employee, per year.*

Pharmacogenomics can reduce these costs by using genetic testing to ensure your employee is receiving the right drug at the right dose based on their genetic makeup.

Many safe and effective medications are used to treat mental health conditions, but getting on the right medication can be a lengthy trial-and-error process. A study conducted by the Mood Disorders Society of Canada found that while 85% of Canadians are able to access the medications they need to treat their condition, a full 58% of them say their medication is not effective.

Taking a pharmacogenetic test for drug compatibility can save time and reduce costs associated with productivity, absenteeism and disability.

Personalized Prescribing test is the only one in Canada that uses a polygenic approach to analyze 54 genes that are specific for mental health-related medications. Results are integrated into algorithms that consider the impact of many genetic variants on response to antidepressants typically prescribed.

The effect of improving the response to medication

Studies have shown that a reduction in depression can improve employee productivity at work by up to seven hours per week. Improvements in depression scores is also correlated with reduced absenteeism.*

Early results from the introduction of the Personalized Medicine by Manulife, showed that 53% of members changed their medication and 82% of members that made the change reported an improvement in symptoms.



They estimate that organizations can save about \$2,400 in direct and indirect costs when a member making \$30/hr optimizes their medication through the program. This finding came as a result 7% of reduction in absence within their disability cohorts, and provided a ROI of 6% fold for our services when embedded in the health benefit.**

* Ontario Chambe of Commece 

** The effect of depression treatment on work productivity 

*** Manulife - Personalized Medicine: Getting you more for your money 

Personalized Medicine puts young man on the road to recovery 

Mental Illness in the workplace

Challenges

Medication failure is the leading cause of mental illness disability



Unlike other health conditions, human resources managers cannot discern or observe mental illness in their employees easily.

Medication failure largely contributes to the complexity of mental illness; understanding these challenges may prove helpful to employers.

Antidepressants fail more than 50% of the time. And they usually take 6 – 8 weeks to show effect. Accompanying antidepressants are side effects that range from mild to severe and intolerable.

Some of these side effects are temporary and will pass as the human body adjusts to them, while others can become permanent. Side effects may result in nonadherence, thus complicating recovery.

Unfortunately, family physicians are generally not trained to diagnose mental illness conditions. Appointments with psychiatrists trained to diagnose and treat mental illness could take months to arrange. Even when employees get access, psychiatric diagnosis still relies on self-reported questionnaires.

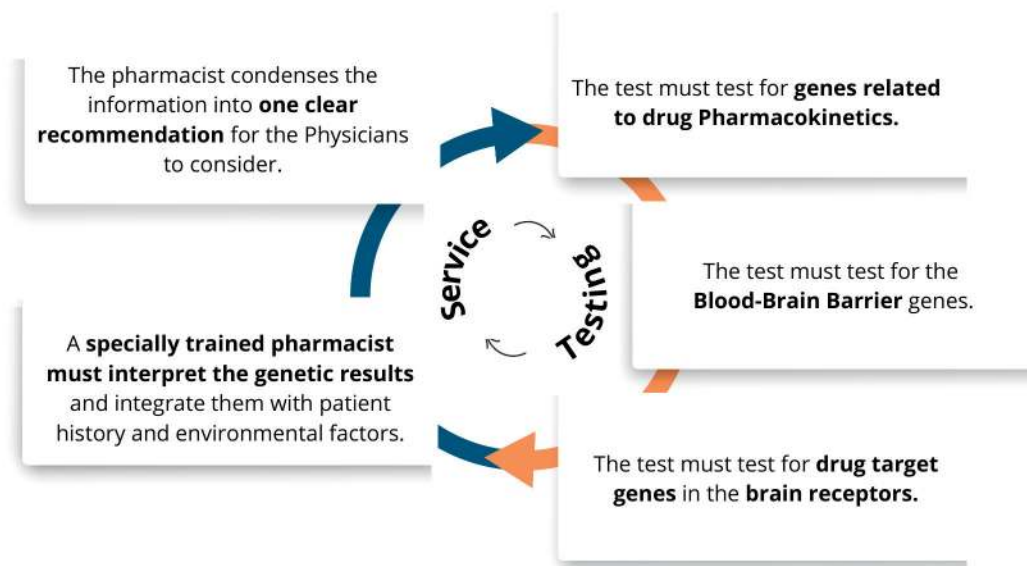
It stands to reason: if medication failure is the cause, then the solution is a mechanism that optimizes antidepressants on a personalized basis; this is pharmacogenomics.

Pharmacogenomics Testing Service

What needs to be included

A simple saliva test can determine the right drug/right dose for an employee undergoing a mental health related condition.

But beware; pharmacogenomics tests vary significantly. An effective pharmacogenomics test must consider:



<i>Metabolism</i>	Must test for the genes that metabolize and clear the drugs from the blood stream. All pharmacogenomics tests available in Canada do this part very well.
<i>Blood-Brain Barrier Receptors</i>	Must test for the blood brain barrier genes to ensure that the drug is able to enter into the brain to attach to its target receptors. Most pharmacogenomics tests available in Canada DO NOT test for these genes.
<i>Brain Receptors</i>	Must test for brain receptors that are the targets of the drug. Most pharmacogenomics tests available in Canada either test for none or a limited number of brain receptors. It is imperative that as many receptors that are known drug targets, both directly and downstream, be tested.

The best tests are not be a transaction, but a full service. The interpretation and summation of these results must be executed by a specially trained psychopharmacist.

Only these pharmacists understand the mechanism of action of the brain receptors and the corresponding drugs that target them.

The Evolution of Pharmacogenomics

Historic Perspective

First generation pharmacogenomics

Pharmacogenomics was formally introduced in Canada in 2014, when CAMH secured a large grant to study its utility for mental illness. The CAMH study, which used Gensight test by Assurex in the US (now Myriad Genetics) generated much hype.🔗

Results from the use of first generation testing were not as reassuring as expected

CAMH tested over 10,000 patients referred by 3,000 doctors. A few insurance companies and large employers participated in the study.

Unfortunately, pharmacogenomics never lived up to the excitement. The Gernesight tested uniquely for metabolic-related genes and only for two brain receptors. There was no inclusion of blood-barrier genes nor the use of pharmacists to produce actionable recommendations.

First generation tests emphasize attributing drug response to drug metabolism, with a strong focus on the analysis of pharmacokinetic genes. While drug metabolism is important, and a key first step to asses drug response, it is not the single most important predictor of it.

From First Generation tests to Second Generation testing service

Multiple studies provide evidence that drug response involves much more than metabolism and the role of metabolic enzymes. The interplay of brain receptors and drug transporters is equally if not more crucial. Variations in these genes are statistically more probable of signs of reduced efficacy or the manifestation of undesirable side effects.

Second Generation pharmacogenomics involves the analysis of the pathways of drug mechanism of action as well as its metabolism, and integrates these results into advanced algorithms to predict drug response reliably.

It also incorporates the intervention of psychopharmacists who are able to integrate the variables of both genetic variants and drugs mechanism of action in order to provide the best recommendation commercially available.



The Pharmacogenomic Testing Process

The Employee Journey

Pre-Pharmacogenomics Testing

Some of us are lucky, we have never experienced a mental illness journey either ourselves or through others we love. The journey can be brutal and understanding it may help you better manage mental illness for your employees.

- Employees feel sad or low mood, but do very little, hoping this is temporary.
- The low mood etc. persists and gets worse, employees might discuss with a close friend or family member. They might seek psychotherapy.
- Psychotherapy may be enough; if not, the low mood continues and gets worse; employees visit their family doctor. At this stage, he/she is certainly losing some productivity.
- Family doctors ask a few questions, prescribe the first line medication as per the guideline; mostly Selective Serotonin Reuptake Inhibitors (SSRI), the first prescription may or may not be effective.
- Antidepressants take 6-8 weeks to show effect. The waiting is tough, but hope is still alive. More productivity losses.
- If not effective after two to three months, the condition enters a new phase; worse depression, loss of confidence in medication, may suffer side effects that are significant, may develop a habit of nonadherence to medication, and now disability becomes a real possibility.
- Doctors usually either increase the dose or change the medication. That is when the employee and/or doctor should ask: why did the first medication fail? How do I know which medication would work for me? Unfortunately, these questions are not raised, instead, the doctor proceeds with the trial & error.
- The second medication is further complicated by possible loss of confidence in medication and nonadherence, more side effects that the employee might not be willing to tolerate, as they hold little confidence in medication.
- If the second medication appears to fail, the employee at this time is seriously losing productivity, taking absent days, and contemplating disability if they have not made the claim already.
- Hopefully the employee contemplates pharmacogenomics is a possible solution and orders the test if covered and eligible.

Patient Referral

Assuming the employee's plan sponsor is with one of the insurance companies using our services and the plan sponsor elected to embed the coverage:

- The employee purchases the test and service using the insurance company's portal provided by their insurance company. He/she will receive a receipt from the portal that they submit to the insurance company who will reimburse them.
- A pharmacist is assigned to that employee, the pharmacist sends an email asking for a good time to have a phone conversation. At that meeting, the pharmacist will answer any questions, the pharmacist will complete a brief input questionnaire.
- The employee will be sent a link with our consent form for their signature.
- The employee will be sent a saliva collection kit by courier with a prepaid return envelope to return the sample to our lab for processing.
- The sample is analyzed in our fully accredited lab and the results are uploaded to our proprietary software.
- The pharmacist reviews the results and decides on the most appropriate medication with an eye for lowest probability of side effects. This is all presented in a concise PDF report to the doctor.
- The pharmacist reaches out to the employee, shares, and discusses the results, explains, and answer the employee's questions and faxes the report to the doctor.
- The pharmacist assures the employee that he/she should stay in touch with their issues and questions. The pharmacist also provides access of the full digital report to the employee.



After the Genetic Test

- The pharmacist analyzes the genetic results and develops her recommendation, explains the rationale to the employee and deliver the results to the doctor.

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- Employees must set up a doctor's appointment to discuss the recommendations and for re prescribing.
 - Doctors usually concur with our pharmacists' recommendations, but some might not agree to all or part of the recommendations. Some doctors will reach out to the pharmacist for discussions, but not all.
 - The discontinued antidepressants must not be stopped suddenly; they must be tapered gradually. Tapering depends upon the medication and how long the employee has been on them, it involves reducing the dose gradually to stopping totally. Tapering could range from one to four weeks, and pharmacists usually advise their employees on the tapering process.
 - The newly prescribed medication is not started at the expected therapeutic dose, it is started at a smaller dose and then increased gradually until the therapeutic dose is arrived. Titrating could take a week or two.
 - Once the new drug reached the therapeutic dose, side effects may begin to beset the employee.
 - Most side effects are temporary, and employees will build tolerance to them, however some are so severe such that the patient cannot tolerate them in the short term. In these cases, the pharmacist may have to change to a different medication or prescribe an adjunct medication that will help with the side effect.
 - Now that the employee is on the new drug and has managed the side effects if any, the next step is to adhere to the medication for the next 4 – 6 weeks to achieve remission.
 - The entire process from the genetic testing to the employee remission takes at least 10 weeks and may even take 16 weeks.

Other Important Factors

The Genetic Non-Discrimination Act

The Genetic Non-discrimination Act prohibits any organization from requiring a genetic test as a condition of payment or a contract. As a result, case managers must offer the service on a voluntary basis.

The act is not meant to complicate disability management, but it is doing just that. Patients cannot decline an independent medical exam, or they will be denied the claim, but they can decline a pharmacogenomics test without any repercussions.

The Genetic Non-Discrimination Act (excerpt)



Prohibitions

- (1) It is prohibited for any person to require an individual to undergo a genetic test as a condition of
- (a) Providing goods or services to that individual.
 - (b) Entering into or continuing a contract or agreement with that individual; or
 - (c) Offering or continuing specific terms or conditions in a contract or agreement with that individual.
- (2) It is prohibited for any person to refuse to engage in an activity described in any of paragraphs (1) (a) to (c) in respect of an individual on the grounds that the individual has refused to undergo a genetic test.

Exceptions: health care practitioners and researchers

- (a) A physician, a pharmacist, or any other health care practitioner in respect of an individual to whom they are providing health services.

Act current to 2022-06-20

Psychotherapy

The correct antidepressants do the heavy lifting, but it is essential that patients seek psychotherapy along with medications. Mental illness is usually caused by stressful environmental factors. Patients must learn to manage these factors, especially if they persist, and the best way to do that is through psychotherapy.

Nutrition, Exercise and General Wellness

Patients suffering from mental illness must lead a healthy lifestyle; good nutrition, adequate sleep, exercise, meditate, stay in touch with family and friends and avoid self-medication, are the best practices.

PharmaPsycare™

Pharmacist assisted medication management program

PharmaPsycare™ is a comprehensive service that provides specialized psychopharmacology assistance for employees and their dependants.

This program allows them to have access to a team of specially trained psychopharmacists to:

- Help manage side effects
- Taper medications
- Monitor new drug treatments to achieve optimal therapeutic outcomes
- Receive ongoing support to patients as needed with no limit of time

This program also includes a pharmacogenetic testing service for genetic drug compatibility which enables our psychopharmacists to suggest the most suitable drug and dosage for their specific mental health-related condition.

Our pharmacists integrate knowledge of both the genetic variants and the drugs' mechanism of action to provide the best recommendation commercially available.

The whole process is totally confidential and no one has access to the patient's unless clear and written consent is provided.

This service is available for employees and dependants for less than one dollar per month.



About Us

Our commitment to mental health



*"Our mission is to create
a new standard of patient care in psychiatry,
that is based on objective data
and clear science."*

Personalized Prescribing is committed to developing world-leading pharmacogenetic algorithms and technology that will ensure each individual can receive the right antidepressant, in the right dose, without suffering through months and, often years, of drug failure and unnecessary side effects, all conducted directly with patients by knowledgeable psycho-pharmacists.

Our Certifications



Certificate No. FM 725054



Certificate No. IS 735706

Our partners



Manulife



Insurance


Equitable Life
of Canada

What our patients are saying about us







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