Biron

Pharmacogenomics (PGx)
for healthcare practitioners

A clinical decision support tool
for genetically-guided prescriptions

Every day, you deal with a whole host of challenges when treating your patients

- → Complex cases due to comorbidities
- → Usual trial-and-error process to find the right medication
- → Health problems that persist or worsen when medications fail to work
- → Lower rates of remission after each pharmacological failure
- → Non-adherence to treatment due to fear of side effects or a perception that it will not be effective

Our PhD-level experts in PGx are always here to support you

Pharmacogenomics (PGx) helps you achieve clinical excellence

30% ↓ PGx significantly reduced the incidence of side effects **by 30%** (n=6,193, p<0.0001).[1]

35% ↓ PGx reduced the incidence of ischemic events **by 35%** in post-PCI patients (n=5,302, p<0.011).[2]

41% ↑ PGx increased the rate of remission **by 41%** in patients with major depressive disorder.[3]
(Meta-analysis of thirteen randomized controlled trials)

PGx improves patient adherence by faciliting patient buy-in to medication treatment by giving confidence to try medication.[4]

1. Swen et al. A 12-gene pharmacogenetic panel to prevent adverse drug reactions: an open-label, multicentre, controlled, cluster-randomised crossover implementation study (2023) Lancet.
2. Ingraham et al. Genetic-Guided Oral P2Y12 Inhibitor Selection and Cumulative Ischemic Events After Percutaneous Coronary Intervention (2023) JACC Cardiovasc Interv.
3. Brown et al. Pharmacogenomic Testing and DepressiveSymptom Remission: A Systematic Review and Meta-Analysis of Prospective, Controlled Clinical Trials (2022) Clin Pharmacol Ther.
4. Vest et al. The Perceived Value of Pharmacogenetic Testing in Depression Treatment: Mixed-Methods Results From the PRIME Care Study. (2025) Psychiatric Services.

Who is the PGx test for?

Biron's PGx test is recommended for optimizing polypharmacy and when pharmacological treatments fail to produce the desired results:

- → **Unmanageable side effects**
- → **Lack of efficacy and suboptimal response**
- → **Reluctance to take medication**

The test is designed to guide medication choices in the following areas:

Mental health	Pain management	Cardio health
Depressive disorders	Chronic pain	Hypercholesterolemia
Anxiety disorders	Acute pain	Coronary artery disease
Bipolar disorders		Acute coronary syndrome
ADHD		

Examples of medication classes covered

Antidepressants	Opioids	Statins
Anxiolytics	NSAIDS	Antiplatelet agents
Antipsychotics	Muscle relaxers	Anticoagulants
Psychostimulants	Complementary treatments	Beta-blockers

In all our tests, If a genetic issue is detected, potentially life-saving recommendations are provided for the following medications: carbamazepine, oxcarbazepine, phenytoin, clopidogrel, codeine, tramadol, tamoxifen, voriconazole, capecitabine, fluorouracil, azathioprine, mercaptopurine, thioguanine, cisplatin.

biron.com/meds

For a complete list of drugs covered by **Biron**'s pharmacogenomic test, visit **biron.com/meds**

The CANMAT (2023) **recommends**

PGx testing for patients with major depressive disorder, after suboptimal response to an initial antidepressant.[5]

5. Lam et al. Canadian Network for Mood and Anxiety Treatments (CANMAT) 2023 Update on Clinical Guidelines for Management of Major Depressive Disorder in Adults (2024) Can J Psychiatry

Pharmacogenomics, an asset for your practice

Helps reduce the prescribing of inadequate doses

Adjusts doses based on the patient's metabolic capacity and improve the efficacy and tolerance of medications.

Guides your treatment choices

Choose medications with an increased likelihood of generating a good response.

Identifies predispositions to particular side effects

Improve your patients' well-being by prescribing medications and doses with less risk of side effects.

Helps manage complex cases

Equip yourself with relevant information for more complex treatments of patients with comorbidities.

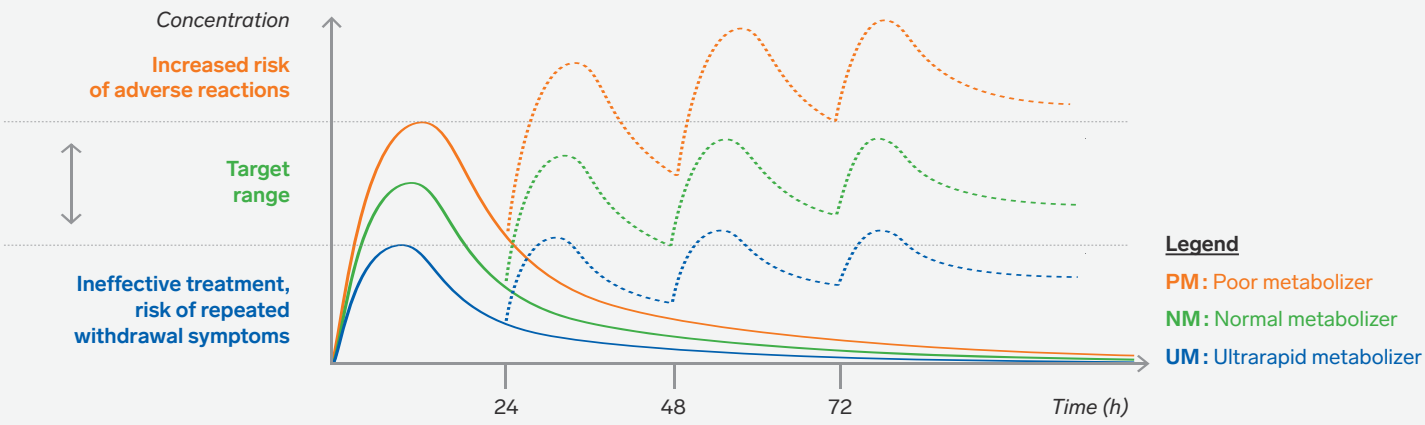
Improves patient adherence

Your patient will feel **more comfortable and engaged** when told the choice was based on their genetic makeup.

Adjust your patient's doses

Drug metabolism is an important factor that can alter clinical outcomes. Standard doses may be unsuitable when metabolism is slower or faster.

Potential effect of metabolic phenotype on drug exposure with multiple doses.



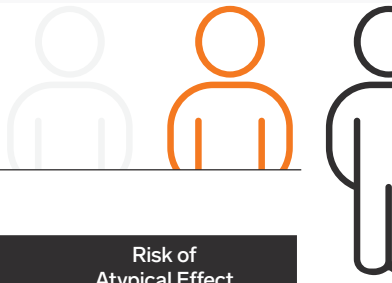
For each of the 19 metabolic enzymes evaluated, the report will determine your patient's metabolic phenotype.

Not everyone reacts to medication the same way

For some patients, finding a treatment that works with few or no side effects can be time-consuming and frustrating. A pharmacological failure not only allows health problems to persist or progress, but a negative experience with medication can make it difficult to adhere to subsequent treatments.

A PGx test is a saliva test that allows you to answer the following questions:

Exposure	Should an adjustment of standard doses be considered due to a metabolic deficiency or gain of function?
Efficacy	Is the patient more or less likely to respond well to the treatment?
Side effects	Is the patient predisposed to experiencing any particular side effects?



Clinical case example on to interpret the report

Identified Genetic Associations

Medication	Exposure	Efficacy	Risk of Atypical Effect
Desvenlafaxine (Pristiq®)	Initiate with recommended dose; a low dose may be adequate (UGT1A1 IM, UGT2B15 IM).	1/2 variants: increased likelihood of poorer response (FKBP5)	Normal risk*
Escitalopram (Cipralex®)	↓ Initiate with recommended dose but consider a slower titration schedule and do not exceed the following daily doses: 15mg for adults up to 65 yrs; 7.5mg for adults 65 yrs or older (CYP2C19 IM).	! 4/6 variants: increased likelihood of a poorer response (FKBP5, GRIK4, HTR2A, BDNF).	! 1/1 variant: increased risk of gastrointestinal side effects (HTR2A).
Venlafaxine-XR (Effexor XR®)	↑ Consider a dose increase up to 150% of the standard dose. If dose adjustment does not result in efficacy, consider an alternative drug not predominantly metabolized by CYP2D6 (CYP2D6 UM).	! 3/4 variants: increased likelihood of a poorer response (COMT, FKBP5, SLC6A2)	Normal risk*

In this example, the clinician is considering three options that are equally indicated for the patient: **desvenlafaxine**, **escitalopram** and **venlafaxine**.

Based on these results, preference should be given to desvenlafaxine at doses potentially lower than normal. For the other two options, the patient has more variants associated with a poorer response, in addition to being more susceptible to nausea/vomiting with escitalopram.

*Note: "**Normal risk***" means that the genetic impact on the risk of side effects is unknown or inconclusive. Depending on the availability of published data, this mention may also appear in the "**Exposure**" and "**Efficacy**" columns.*

Benefits of Biron's PGx test

Over 200 medications covered

Guides the use of the most commonly prescribed medications for ADHD, mental health disorders, pain mangement, and cardiovascular conditions.

Long-term usefulness

Test results are stable over time, providing a long-lasting resource to guide your medication choices today and for the years ahead.

Backed by science

Every recommendation is based on pharmacogenomic guidelines and/or peer-reviewed scientific research.

Comprehensive and intuitive

Developed in collaboration with nearly **40 specialists, Biron**'s PGx test is a complete and convenient reference tool that encourages clinical judgment.

Patient data remains confidential

Patient data is encrypted on multiple levels and stored on Canadian servers that meet or exceed the most stringent security standards. Our SOC2 Type 2 certification is assessed annually by an external auditor to ensure the robustness of our systems. Data is not sold or shared without patient consent.

Large panel of genes tested

The Biron PGx test uses a comprehensive genotyping panel, incorporating common and rare variants found in multiple ethnic populations.

Pharmacokinetic genes tested: 22 (ABCB1, ABCG2, CES1, CYP1A2, CYP2A6, CYP2B6, CYP2C cluster, CYP2C19, CYP2C9, CYP2D6, CYP3A4, CYP3A5, CYP4F2, DPYD, NUDT15, POR, SLCO1B1, TPMT, UGT1A1, UGT1A4, UGT2B15, UGT2B7)

Pharmacodynamic genes tested: 29 (ADRA2A, ANKK1, BDNF, CACNG2, CNR1, COMT, DRD2, DRD3, FAAH, FKBP5, GNB3, GRIK1, GRIK4, HLA-A*31:01, HLA-B*15:02, HTR2A, HTR2C, HTR7, INSIG2, lncRNA, MC4R, MTHFR, OPRM1, SLC6A2, SLC6A4, SLC6A5, TH, TPH2, VKORC1)

Find **online resources** to support your practice, from prescribing the test to interpreting the report

biron.com/pgx-healthcare

Biron maintains the **highest quality standards**

Our accredited laboratory and our processes ensure reliable results and data security.

CAP ACCREDITED
COLLEGE of AMERICAN PATHOLOGISTS

AICPA SOC

Integrate personalized medicine into your practice today

1 Filling out and submitting the requisition form

Complete the requisition form and hand it over to your patient.

2 Ordering the test

The test can be ordered online, by patients themselves or with the assistance of your medical team for full support.

3 Collecting and sending the sample

Your patient follows the instructions for collecting saliva and returns the sample with the prescription in a prepaid return envelope.

4 Analyzing and reviewing the results

An email notification is sent as soon as the results are available, within 10 business days. The detailed report is available via **Biron**'s secure portal.

Patient support
→ Consultation with a pharmacist is included

Physician support
→ Assistance from PGx experts (PhD) is included

Biron

Contact **Biron Genetics**
for more information

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About Biron Health Group

Founded in 1952, **Biron** is recognized for its expertise in **six fields of healthcare**:

- → Medical Laboratory
- → Sleep Care
- → Medical Imaging
- → Health at Work
- → Genetics
- → Pathology

A proud Quebec company, **Biron** brings together the strengths of nearly 1,000 competent, rigorous and caring professionals. This attentive team supports you in your everyday practice by offering services that help you focus on what is most important: your patients.