ISRCTN93153882 https://doi.org/10.1186/ISRCTN93153882

# Treatment outcome improvements by using Rx Report (a pharmacogenomic test) in depressive disorder patients

**Submission date**
23/12/2021

**Recruitment status**
Stopped

**Registration date**
25/02/2022

**Overall study status**
Stopped

**Last Edited**
01/09/2023

**Condition category**
Mental and Behavioural Disorders

[X] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

## Plain English summary of protocol

Background and study aims
Depressive disorders are projected to be one of the leading causes of disease in adults worldwide by 2030. The antidepressant medications required to treat these disorders are known to require optimizing, switching, or addition of other therapies. The available studies indicate that half of patients show inadequate responses or drug-related side-effects to these medications during 8 to 12 weeks after the initiation of the dosage regime. The delays in getting the medication or dosage correctly are frustrating for the patient and can impact the uptake of medications. Nearly half (40-50%) of the variance in anti-depressant response is a result of common genetic variations. Personalized Prescribing Inc. has developed a comprehensive genetic panel (Rx Report) that includes 54 genes relevant to pharmacokinetics and pharmacodynamics of antidepressant medications based on our research. The researchers believe that the study findings will help in understanding how pharmacogenomic testing can improve treatment outcomes in depressive patients. The aim of this study is to assess the impact of the Rx Report on clinical outcomes in patients with depressive disorders.

Who can participate?
Patients aged between 18 - 65 years, recently diagnosed with major depressive disorder.

What does the study involve?
The patients will be randomly assigned into one of the two groups: the immediate-access group will receive the Rx Report within three months of recruitment, whereas the delayed-access group will receive the Rx Report between the fourth and sixth months (approximately three months after the immediate access group). The main study outcome is the depression scores difference between the two groups as measured by the Physical Health Questionnaire-9.

What are the possible benefits and risks of participating?
If the findings indicate that the immediate access of Rx Report improves the treatment outcomes in patients with depressive disorder, the Rx Report can help physicians to tailor medications for these patients quickly rather than a longer medication trial and switching periods. It is expected that these changes will improve overall patient outcomes.

Where is the study run from?
Personalized Prescribing Inc. (Canada)

When is the study starting and how long is it expected to run for?
December 2021 to December 2024

Who is funding the study?
Personalized Prescribing Inc. (Canada)

Who is the main contact?
Sanjida Ahmed, PhD, sanjida@personalizedprescribing.com

# Contact information

### Type(s)
Principal investigator

### Contact name
Dr Sanjida Ahmed

### ORCID ID
https://orcid.org/0000-0002-9377-1933

### Contact details
150 Ferrand Drive, Suite #500
Toronto
Canada
M3C3E5
+1 (0)6479430210 ext 263
sanjida@personalizedprescribing.com

# Additional identifiers

### Clinical Trials Information System (CTIS)
Nil known

### ClinicalTrials.gov (NCT)
Nil known

### Protocol serial number
Nil known

# Study information

### Scientific Title
Evaluating Personalized Prescribing Inc's pharmacogenomic profiling (Rx Report) for optimizing treatment in patients with depressive disorders: an ambulatory-care, delayed-access randomized controlled trial

## Study objectives
In patients prescribed antidepressant drugs when suffering from depressive disorders, their high genetic variations resulted in failure to respond to many medications. In addition, they experience a number of side effects that further complicate their cases and increase morbidity. Medication changes based on patients' genetic make-up would significantly reduce morbidity levels. Hence, the researchers are proposing to conduct a randomized controlled trial to assess the impact of Personalized Prescribing Inc. (PPI's) pharmacogenomic profiling report (Rx Report) on clinical outcomes in patients with depressive disorders.

## Ethics approval required
Old ethics approval format

## Ethics approval(s)
Approved 24/02/2022, Veritas IRB, USA (3551 St. Charles Blvd., Suite 501, Kirkland, Quebec, H9H 3C4, Canada; +1 (0)514 337 0442; aasimoeslopes@veritasirb.com), ref: 2022-2932-9860-8

## Study design
Interventional randomized controlled trial

## Primary study design
Interventional

## Study type(s)
Diagnostic

## Health condition(s) or problem(s) studied
Depressive disorders

## Interventions
The researchers propose to conduct an ambulatory care-based, open-label, two-arm randomized controlled trial in which patients are randomized to either immediate access to Rx Report with pharmacist guidance, i.e., within 3 months of recruitment, or to the delayed access to Rx Report, i.e., between the 3rd and 6th month of randomization (control group). The study will evaluate patient outcomes in immediate access and delayed access groups at 3 months and 6 months of the recruitment. It is expected that physicians will be seeing patients in both groups at six weeks (approx. midpoint between randomization and first follow-up). At that visit, the patients in the intervention group will have access to Rx Report, whereas the patients in the control group will not have access to the report.

Once the patients complete the screening and consent processes, they will be randomly assigned to one of the two groups, immediate access or delayed access to Rx Report. Patients will be randomized 1:1 using a computer-generated allocation produced by open-source software, MinimPy or similar. In both groups, the patients will be requested to provide a saliva sample (via mail) to the PPI. PPI will perform the pharmacogenomic profiling in approximately 7 – 10 business days.

Personalized Prescribing Inc. provides a pharmacogenomic test (Rx Report) with medication recommendations for patients with depressive disorders based on their own algorithm using a polygenic approach. They extract the patient's DNA from saliva samples and assess for the presence of 104 key genetic variations from 54 genes related to metabolism and mechanism of action of medications prescribed for depressive disorders. Based on the results, the Rx Report is

generated recommending prescription changes. The results are communicated to patients and their physicians by a licensed pharmacist using phone, email or web access to reports. The test is currently in use by health practitioners across Canada. The researchers have evaluated the effectiveness of the test (Rx Report) previously in an observational study (https://pubmed.ncbi.nlm.nih.gov/34413872/).

For patients who are randomized to the immediate access group, the Rx Report will be made available to the physician/patient via email and a follow-up call will take place between a licensed pharmacist and patient at that time. The psychiatrist (treating physician) will have access to the Rx report and may or may not decide to change medications as suggested in the report. With the patient's consent, the researchers will track the prescription history of the patient during the 6-month period for the immediate access group.

Patients who will be randomized to the control group will follow the same procedure as above, however, their Rx report will be sent to the physician and patient on the 91st day (not business days) after it becomes available. Again, the email report will be followed up by a phone call by the pharmacist to the patient. The psychiatrist will have a choice to change medications as suggested. With the patient's consent, the researchers will track their prescription history during the 9-month follow-up period (or 6 months after providing the report).

The researchers have chosen to have delayed access as a comparator as they believe that this intervention may benefit patients in both groups. Nevertheless, the pharmacogenomic report will be generated in both groups, and hence it makes sense to share the report if the patient can benefit from it. A research assistant unaware of allocation status (immediate or delayed) will conduct the follow-up interview with a standardized outcome questionnaire under the supervision of the research coordinator.

### Intervention Type
Genetic

### Primary outcome(s)
Depressive symptoms measured using the Physical Health Questionnaire-9 (PHQ-9) score at baseline and at 3 months and 6 months after the main intervention

### Key secondary outcome(s))
1. Anxiety symptoms measured using the Generalized Anxiety Disorder Scale (GAD-7) score at baseline and at 3 months and 6 months after the main intervention
2. Depression symptoms measured using the Montgomery-Asberg Depression Rating Scale (MADRS) at baseline and at 3 months and 6 months after the main intervention

### Completion date
31/12/2024

### Reason abandoned (if study stopped)
Participant recruitment issue

## Eligibility

### Key inclusion criteria
1. Patients with newly diagnosed depressive disorder (>9 on the Physical Health Questionnaire Version 9 [PHQ-9] screening at baseline in the last 2 years

2. Patients who are on one antidepressant prior to being diagnosed
3. Aged between 18 years and 65 years
4. Have provided written informed consent
5. Have completed sixth grade or higher education in English language to respond to standard questionnaires

## Participant type(s)
Patient

## Healthy volunteers allowed
No

## Age group
Adult

## Lower age limit
18 years

## Sex
All

## Key exclusion criteria
1. Patients on more than two antidepressants at the time of recruitment
2. Acute myocardial infarction in the past 12 months
3. Traumatic brain injury requiring hospitalization in the past 12 months
4. Concussion related emergency or physician visit in the past 5 years
5. Suffering from congestive heart failure
6. Are pregnant and lactating
7. History of epilepsy or seizures
8. Uncontrolled hypertension diagnosed by a physician (consistently elevated systolic blood pressure ≥150 mmHg or diastolic blood pressure ≥90 mmHg)
9. History of concussion in the past 12 months
10. History of stroke
11. Uncontrolled diabetes (HbA1c >8.0%)
12. History of chronic pain
13. History of autoimmune condition
14. History of Bipolar Disorder
15. History of Autism Spectrum Disorder (ASD)
16. History of Attention Deficit Hyperactivity Disorder (ADHD)
17. History of neurodevelopmental disorder (e.g., intellectual disability)
18. History of neurodegenerative disorders (Alzheimer's disease, Parkinson's disease, Huntington's disease etc)
19. History of Schizophrenia Spectrum Disorder
20. History of malignant tumor
21. History of liver failure
22. History of renal insufficiency
23. History of substance misuse treatment
24. Consuming alcohol more than three drinks per day for men (≥15/week) or two drinks per day for women (≥10/week) or one binge-drinking episode per week.
25. Consuming cannabis or its derived products more than two times per week
26. Consuming illicit substances (not prescribed by physicians) once or more per week

27. History of using anti-depressant medications for conditions other than depression e.g., smoking cessation in the past 5 years
28. History of or planned bariatric surgery within 6 months of pharmacogenomic testing
29. Participants not willing to sign the informed consent
30. Participants unable to respond to standard questionnaires in English

**Date of first enrolment**
01/04/2022

**Date of final enrolment**
30/03/2024

# Locations

**Countries of recruitment**
Canada

**Study participating centre**
**Personalized Prescribing Inc.**
150 Ferrand Drive, #500
Toronto
Canada
M3C3E5

# Sponsor information

**Organisation**
Personalized Prescribing Inc.

# Funder(s)

**Funder type**
Industry

**Funder Name**
Personalized Prescribing Inc.

# Results and Publications

**Individual participant data (IPD) sharing plan**

The study will be using RedCap for on/offline data capture for the day-to-day study operations. RedCap is a secure web application for building and managing online surveys and databases which is compliant with 21CFR Part 11, FISMA, HIPPA and GDPR.
All data are protected and stored in PPI's secure database, Microsoft Azure and IBM Softlayer which are highly secured. None other than PPI pharmacists and study coordinator will have access to the data. The psychiatrists will only receive Rx report pharmacogenomic test recommendation from PPI pharmacists. All participants in the intervention group will receive access to their genetic information through a secure server (IBM Softlayer) after psychiatrists prescribe medication for them guided by Rx report.

## IPD sharing plan summary

Stored in non-publicly available repository