What to do if a patient asks "Should I get PGx testing?"

A Conversation Guide

Conversation Objectives

1. Assess patient understanding of pharmacogenomics (PGx) and medication response and be able to answer questions.
2. Discuss and manage the patient's expectations for PGx testing.
3. Consider reviewing the Pharmacogenomic Testing Info for Clinicians to prepare for additional questions your patients might have.

I am thinking about getting PGx testing. Should I do it?

- A good first step is to assess what the patient knows about PGx testing and what hopes or expectations they have about getting the testing. This will tell you how much (if any) further information is required or if the patient has misconceptions about PGx testing that you should address.

What is PGx testing? Why would someone get it?

- A DNA sample is taken from the blood, the saliva, or via a cheek swab. The DNA is tested for certain variants in certain genes relevant to processing medications. PGx testing in general works by assessing how fast a gene of interest tells the body to process medications. The different speeds at which genes tell the body to process medications are referred to as "metabolizer phenotypes" (or "metabolizer types") and range from very slowly ('poor metabolizer' type) to very quickly ('rapid' or 'ultrarapid metabolizer' types). The 'normal metabolizer' type falls in the middle and can be considered a medium speed. The results of the PGx test will tell you your metabolizer type for each gene on the test. **PGx testing gives us an extra bit of information that we can use to reduce uncertainty in prescribing certain drugs.**

Will PGx testing say what the 'right drug for me' is?

- This is an important misconception to address. In short, no. PGx testing is an additional piece of information that can be used when making a prescribing decision by indicating which drugs are less likely to work or more likely to cause side effects. PGx testing reduces but does not eliminate uncertainty. It's important to remember that there are many factors in how medications are processed, including age, sex, weight, and other medications and supplements being taken.

How much sway do the PGx test results have in determining what medication I take?

- Just like there are many factors that go into how medications are processed, there are many factors considered when choosing a drug to prescribe. Reassure the patient that their choice of medication, prior experience with medication(s), and clinical indication matter and will be used to make a final decision. If a medication shows up on the "not recommended" list but the patient has already tried it and is providing benefit as intended without side effects, they may continue. Similarly, if a medication appears as "recommended" but the patient has prior negative experience with it (eg. side effects or limited effect), it will not be prescribed again.

How do I pick a testing company?

- Patients should pick a testing company that includes genes and variants relevant to the medications they are curious about. There's a list of common drug-gene pairs in the Pharmacogenomics Testing Info for Patients handout.
- Tests should be performed in an accredited laboratory. Patients may be more comfortable choosing a company that performs its tests in Canada, so they should find out where the company's lab is.
- Patients should familiarize themselves with a test company's policies and be sure to alert their provider if they should expect a PGx results report or if they need a referral.
- Test cost and insurance coverage (more below) are also important factors to consider.
- An updated version of the test list, first described in a peer-reviewed article by Al Maruf et al (2020), is a good place to start.

How much does PGx testing cost? Is it covered in Canada?

- PGx testing for medications is not covered publicly in Canada. The average test cost is $500.
- PGx testing may be covered in whole or in part by extended insurance plans, but this will vary by insurance provider and plan type. Patients should contact their insurance provider to confirm coverage prior to getting PGx testing.

Share the Pharmacogenomic Testing Info for Patients handout with patients to review at home to reinforce the conversation and provide further reading and resources.

What to do if a patient walks in with a PGx test report

A Conversation Guide

Conversation Objectives

1. Understand why the patient has sought out PGx testing, noting that this may be a difficult and lengthy conversation for the patient depending on their experience.
2. Engage with the patient using the appropriate level of information depending on their knowledge and experience. Answer questions and address misconceptions about PGx testing as they come up.
3. Consider a system for reviewing results and providing follow-up care or resources.
4. Consider reviewing the Pharmacogenomic Testing Info for Clinicians to prepare for additional questions your patients might have.

A patient has brought a PGx test report with them to their appointment. Where should the conversation start?

- Asking the patient why they decided to get the testing in an empathetic and non-judgmental way is a good way to assess their expectations about PGx testing and can open the door to answer questions they might have about the process or their results or can be an opportunity to address misconceptions. Use an open-ended question, such as "why did you decide to get PGx testing?" or "tell me more about getting the testing."
- Be patient and empathetic. Patients may find this conversation difficult or emotional and they may need more time than usual to have the discussion. If you have advance notice of someone bringing in a PGx report, consider booking a longer appointment so you are not rushed.

How does PGx testing work? Why don't the results give a clear indication of the 'best' drug for me?

- PGx testing works by assessing how fast a gene of interest tells the body to process medications. The different speeds at which genes tell the body to process medications are referred to as "metabolizer phenotypes" (or "metabolizer types") and range from very slowly ('poor metabolizer' type) to very quickly ('rapid' or 'ultrarapid metabolizer' types). The 'normal metabolizer' type falls in the middle and can be considered a medium speed.

- Generally, the strongest evidence for PGx based prescribing decisions are for poor metabolizers and rapid/ultra rapid metabolizers.
- PGx testing is an additional piece of information that can be used when making a prescribing decision by indicating cause side effects). PGx testing reduces but does not eliminate uncertainty and it cannot pick the 'best' drug because genetics is not the only thing affecting medication processing.

What do the different metabolizer types mean?

- Poor metabolizer: this is the slowest metabolizer type. Because the body breaks down the medication slower than expected, there is more of it in your body at any given time, which can lead to side effects. Consider a decrease in dosage or changing to a medication outside
- Intermediate metabolizer: the body breaks down medications slightly slower than expected. This may lead to side effects.
- Normal metabolizer: the body breaks down medications related to the gene pathway at the expected speed. In terms of PGx-specific recommendations, drugs can be prescribed at a normal starting dose.
- Rapid or Ultrarapid metabolizer: the body breaks down medications faster than expected. This means there is less medication in your body at any given time and you may not notice a clinical effect. If you are otherwise tolerating this medication well, we might consider increasing the dose.

What else is considered when deciding to stay on a medication or switch to a new one?

- Patient preference, current efficacy, side effects and their tolerability are all considered. PGx results can help prioritize what to try but are only one factor.

Where can patients go to find more information?

- The Pharmacogenomic Testing Info for Patients handout includes further reading and resources. Patients can also reach out to their pharmacist to book an appointment for a medication review. Some testing companies offer consultations with a pharmacist or genetic counselor.