What is Pharmacogenomics?

How to say it: FARM-ah-KO-jeh-no-micks

Pharmacogenomics is the study of how **a person's genome affects how they respond to medications.** Knowing about our genes can help guide medical treatment. This might include predicting which medications work best for each person, or what dose to prescribe.

Terms to Know

Genome: All of our genetic material, our DNA; the "instruction manual" for our bodies

Metabolize: How our bodies process and breakdown things like food or medicine so our bodies can use them

What are the possible results of a pharmacogenomic test?

Intermediate/Poor Metabolizer

These people have **reduced, very little** or **no** ability to metabolize or breakdown the medication.

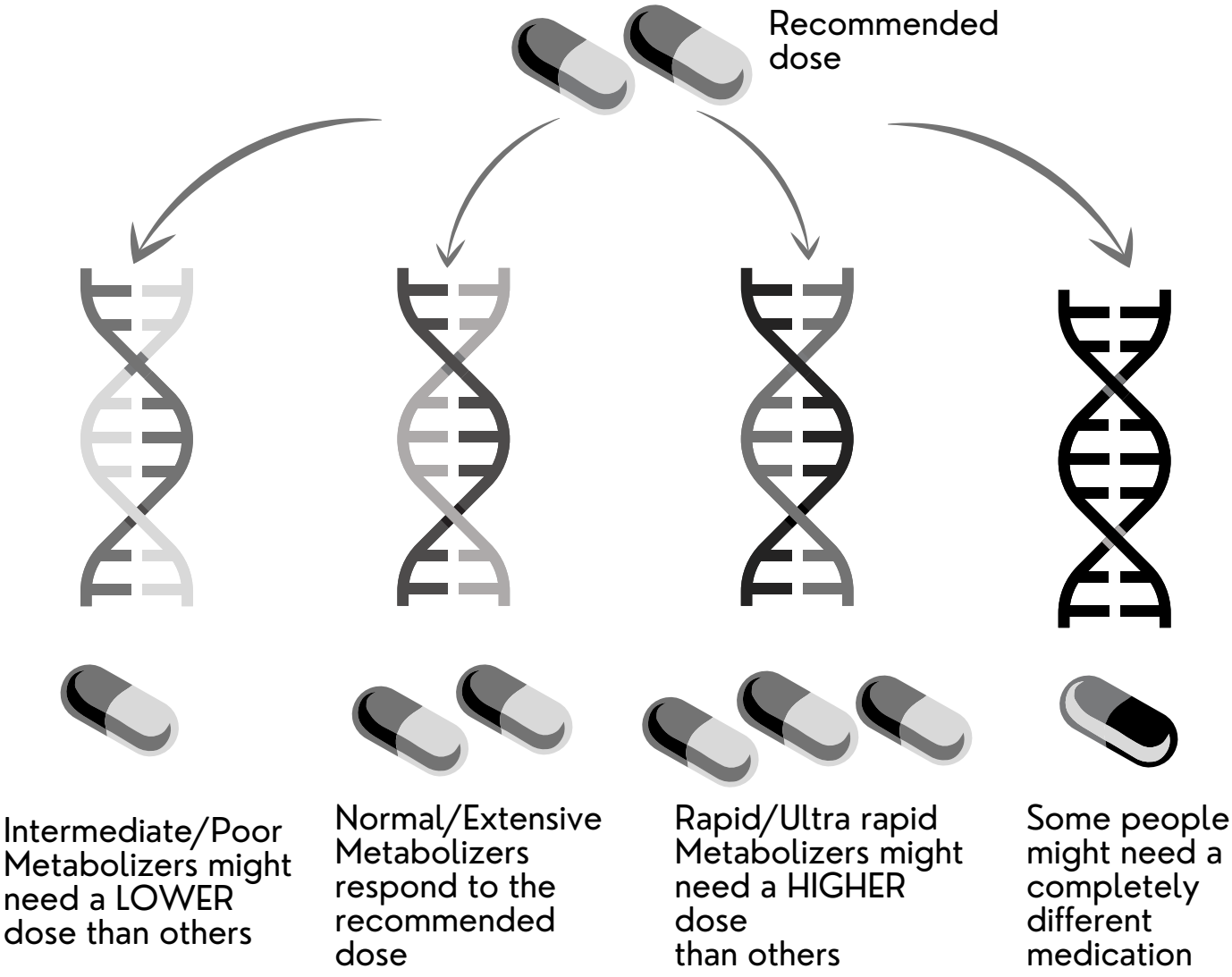
Normal/Extensive Metabolizer

These people have a **normal** ability to metabolize or breakdown the medication.

Rapid/Ultra-Rapid Metabolizer

These people have an **increased** ability to metabolize or breakdown the medication.

Let's take a look at how DNA can affect our response to medication:



When should children be tested?

It is not common for children to have pharmacogenomic testing. Most research about genetics and medication metabolism is done in adults, whose bodies and metabolisms work differently than children's. However, there are a few situations where this type of testing is recommended for children, including:

- Before starting some types of anti-seizure medications in specific groups of people (e.g. carbamazepine in individuals of Asian ancestry, valproic acid in children with mitochondrial disorders)
- Children who need a lot of pain medication, such as for sickle cell crises
- Before starting abacavir for HIV positive children
- Before starting some types of chemotherapy for childhood cancer

Commonly Asked Questions

Will pharmacogenomic testing tell me exactly how my body will break down and respond to a medication?

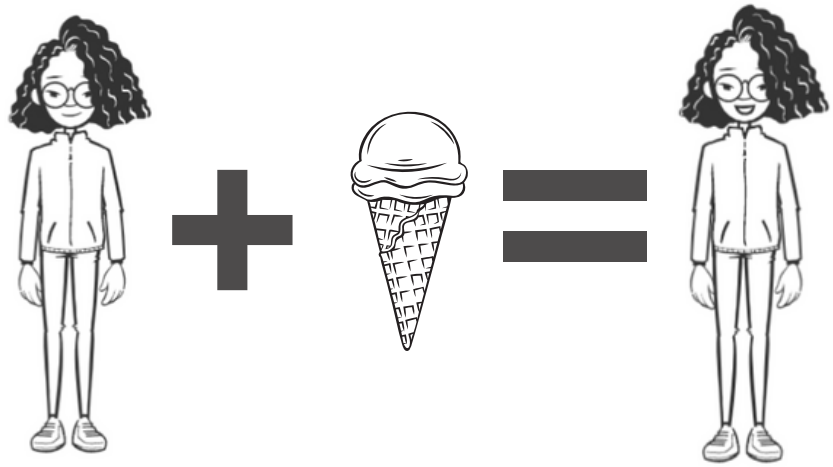
Not quite. Our genes are not that simple. Other factors, like the environment or other unknown genes, can affect how we respond to medications.

Can I have this testing to find out about every type of medication?

No. Testing is only available for some types of medications. There are still many other genes that affect our metabolism that have not been studied enough yet.

Metabolism can be complicated, so here is a simple example with food to help you think about it.

If we are a normal metabolizer of lactose, a chemical in dairy products, eating ice cream and cheese won't cause any problems or make us feel sick.



However, if we are a poor metabolizer of lactose, eating ice cream and cheese can cause problems and make us feel sick (upset stomach, gas, bloating).