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PGx

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DOB: Apr 05,1985
Sex: M
Patient#: FT-PT8614864

Accession
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Report Date: Dec 27,2023

Hello Charles,

Welcome to your Picture PGx report.

WHAT DO MY RESULTS MEAN?

- Your results can provide information on how your body may respond to certain drugs. **However, no changes to medications should be made based solely on this report. Discuss these results with your healthcare provider before making any changes to your health and medication plan.**
- Certain drugs may be more or less effective based on how your body metabolizes them. The tables provided in your report highlight which genetic variants you have that may impact your metabolism of these drugs. This information may also help you avoid adverse drug reactions, or ADRs.
- All laboratory tests have limitations. You may still have an adverse or unexpected drug reaction even if it is not indicated by this report.

HOW CAN I USE THIS REPORT?

- Pharmacogenetic information is complex and can be difficult to interpret. In addition, PGx results alone cannot give clear direction as to whether you should take more or less of a certain medication: only a physician or clinical pharmacist with knowledge of your medical history can do that. For this reason, what you can do with your medication planning based on these results cannot be determined until discussed in the context of your specific medications and medical history with your healthcare provider.
- You may wish to bring this report to your future doctor appointments in order to best assess any new medication plans that may be prescribed.
- **A quick-reference guide is included on the following page, with additional information on how to read your results.**

WHAT CAN I DO NEXT?

- Talk with your healthcare providers to help guide your prescription plan based on your results. Do not make any changes to your medication before talking with your healthcare provider(s) first.
- If you haven't already spoken with a genetic counselor from PWNHealth, we encourage you to reach out to discuss your results - it's included in the price of your test. You can schedule a session from your online Picture account or by contacting PWNHealth at 888-493-7333 or gc@pwnhealth.com.
- Consider sharing your results with your family members. As genetic changes can run in families, this information may be relevant for their health as well.

Report Sections Explained

PGx reports can be long and include many different parts. In this case, there are four main results sections:

Comprehensive Drug Analysis

A broad overview meant for you to quickly see the results for each type of medication analyzed. This section is grouped by medical area.

Actionable Results

Results that may be used by your physician to adjust dosages or medications, because they are associated with an actionable guideline or recommendation.

Informative Results

Results that have implications for the metabolism of certain drugs, however, no actionable guidelines are currently associated with them. These can be useful to know but might not be used to adjust dosages or medications.

Note that you may not have results for this section, which is not unusual.

While actionable and informative results are included in the Comprehensive Drug Analysis overview, these sections go more in-depth for each.

Full Genetic Results

A list of all variants tested, along with the result for each, for you or your physician to reference as needed.

Table Columns Defined

This column includes the **generic name of the drug** analyzed. Note that many drugs also have brand names, which are not listed. For example, ibuprofen would be the generic name for the brand name Advil.

The **interpretation** column summarizes the result for this drug and its implications. A complete interpretation in the context of your specific medical history and situation will only be available when discussed with your healthcare provider or a clinical pharmacist.

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Codeine	Opioids	*CYP2D6*	Poor Metabolizer *3/*4	Based on the genotype result this patient is predicted to be a poor metabolizer of CYP2D6 substrates. This patient may be at a high risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments or …peutic agents may be necessary … metabolized by the CYP2D6	FDA, CPIC (PMID: 22205192, 24458010, 33387367)

The **"drug class"** is the category that this drug falls into (for example, antibiotics, antidepressants, statins, etc.)

Your **"genotype"** or **"diplotype"** is your specific genetic variant (or your genetic code at that location).

Your **"phenotype"** is the result of that genetic code. For example, based on your genotype, you may be a fast metabolizer of a certain drug. Depending on the available data, a phenotype may or may not be listed for every genotype.

This indicates the scientific organizations, institutions, or reports that were referenced to determine the result.

Results: Comprehensive Drug Analysis

Your pharmacogenetic results are generally broken down into three categories: actionable, informative, and standard precautions. "Actionable" results may be used by your physician to adjust your dosages or medications. **(No adjustments should be made before consulting your physician.)** "Informative" results have implications for your metabolism of certain drugs, however, no actionable guidelines are currently associated with them. Lastly, "standard precautions" means that at the time of testing, your results did not indicate any implications for your metabolism of that drug, and therefore standard precautions should be taken.

This section represents a broad summary of your results, with one of the three categories indicated for every drug analyzed. Drugs are grouped according to their area of medicine. Note that your report also includes more in-depth tables on your actionable results and informative results.

Actionable	Informative	Standard Precautions
A result for this drug is associated with an actionable guideline or recommendation.	A result for this drug has some evidence of impact and may be informative.	No actionable or informative results were identified related to this drug.

Anesthesiology

Drug Class	Drug	Actionable	Informative	Standard Precaution
Anesthetics	**Desflurane**			X
Anesthetics	**Enflurane**			X
Anesthetics	**Halothane**			X
Anesthetics	**Isoflurane**			X
Anesthetics	**Methoxyflurane**			X
Anesthetics	**Mivacurium**			X
Anesthetics	**Sevoflurane**			X
Anesthetics	**Succinylcholine**			X

Cardiology

Drug Class	Drug	Actionable	Informative	Standard Precaution
Antiarrhythmic Agents	**Flecainide**		X	
Antiarrhythmic Agents	**Propafenone**	X		
Anticoagulants	**Acenocoumarol**		X	
Anticoagulants	**Warfarin**	X		
Antiplatelets	**Clopidogrel**			X
Beta Blocker	**Metoprolol**		X	
Statins	**Atorvastatin**	X		
Statins	**Fluvastatin**	X		
Statins	**Lovastatin**	X		
Statins	**Pitavastatin**	X		
Statins	**Pravastatin**	X		

Drug Class	Drug	Actionable	Informative	Standard Precaution
Statins	**Rosuvastatin**	X		
Statins	**Simvastatin**	X		

Gastroenterology

Drug Class	Drug	Actionable	Informative	Standard Precaution
Proton Pump Inhibitors	**Dexlansoprazole**			X
Proton Pump Inhibitors	**Lansoprazole**			X
Proton Pump Inhibitors	**Omeprazole**			X
Proton Pump Inhibitors	**Pantoprazole**			X
Proton Pump Inhibitors	**Rabeprazole**			X

Gynecology

Drug Class	Drug	Actionable	Informative	Standard Precaution
5-HT Receptor Modulator	**Flibanserin**			X

Immunology

Drug Class	Drug	Actionable	Informative	Standard Precaution
Immnosuppressants	**Azathioprine**			X
Immune Modulatory Agents	**Siponimod**	X		
Immunosuppressants	**Tacrolimus**			X

Infectious Disease

Drug Class	Drug	Actionable	Informative	Standard Precaution
Antibiotic	**Isoniazid**			X
Antifungal Agents	**Voriconazole**			X
Antiretrovirals	**Abacavir**			X
Antiretrovirals	**Efavirenz**	X		
Antivirals	**Nevirapine**		X	
Antivirals	**Peginterferon Alfa-2A**	X		
Antivirals	**Peginterferon Alfa-2B**	X		
Antivirals	**Ribavirin**	X		
Protease Inhibitors	**Atazanavir**			X

Neurology

Drug Class	Drug	Actionable	Informative	Standard Precaution
Anticonvulsants	**Brivaracetam**			X
Anticonvulsants	**Carbamazepine**			X
Anticonvulsants	**Clobazam**			X
Anticonvulsants	**Fosphenytoin**	X		
Anticonvulsants	**Oxcarbazepine**			X
Anticonvulsants	**Phenytoin**	X		
Central Monamine Depleting Agents	**Deutetrabenazine**	X		
Monamine Depletors	**Tetrabenazine**	X		
Potassium Channel Blockers	**Amifampridine**			X
Potassium Channel Blockers	**Amifampridine Phosphate**			X
VMAT2 Inhibitor	**Valbenazine**	X		

Oncology

Drug Class	Drug	Actionable	Informative	Standard Precaution
Antibody-drug Conjugate	**Sacituzumab Govitecan-hziy**			X
Antiemetics	**Dronabinol**	X		
Antiemetics	**Metoclopramide**	X		
Antiemetics	**Ondansetron**	X		
Antiemetics	**Tropisetron**	X		
Antiestrogens	**Tamoxifen**	X		
Antineoplastic Agents	**Mercaptopurine**			X
Antineoplastic Agents	**Thioguanine**			X
Antineoplastic Agents	**Belinostat**			X
Antineoplastic Agents	**Capecitabine**			X
Antineoplastic Agents	**Erdafitinib**	X		
Antineoplastic Agents	**Fluoruracil**			X
Antineoplastic Agents	**Gefitinib**	X		
Antineoplastic Agents	**Irinotecan**			X
Antineoplastic Agents	**Tegafur**			X
Detoxifying Agents	**Rasburicase**			X
Hypoxia-Inducible Factor Inhibitors	**Belzutifan**			X

Pain Management

Drug Class	Drug	Actionable	Informative	Standard Precaution
Central Alpha Adrenergic Agonists	**Lofexidine**	X		
Non-Steroidal Anti-Inflammatory Drugs	**Celecoxib**	X		

Drug Class	Drug	Actionable	Informative	Standard Precaution
Non-Steroidal Anti-Inflammatory Drugs	**Flurbiprofen**	X		
Non-Steroidal Anti-Inflammatory Drugs	**Ibuprofen**	X		
Non-Steroidal Anti-Inflammatory Drugs	**Lornoxicam**	X		
Non-Steroidal Anti-Inflammatory Drugs	**Meloxicam**	X		
Non-Steroidal Anti-Inflammatory Drugs	**Piroxicam**	X		
Non-Steroidal Anti-Inflammatory Drugs	**Tenoxicam**	X		
Opioids	**Codeine**	X		
Opioids	**Hydrocodone**	X		
Opioids	**Methadone**		X	
Opioids	**Oliceridine**	X		
Opioids	**Tramadol**	X		

Psychiatry

Drug Class	Drug	Actionable	Informative	Standard Precaution
Antidepressants	**Bupropion**		X	
Antipsychotics	**Brexpiprazole**	X		
Antipsychotics	**Clozapine**	X		
Antipsychotics	**Haloperidol**		X	
Antipsychotics	**Iloperidone**	X		
Antipsychotics	**Pimozide**	X		
Antipsychotics	**Risperidone**		X	
Antipsychotics	**Thioridazine**	X		
Antipsychotics	**Zuclopenthixol**		X	
Antipsychotics	**Aripiprazole**	X		
Antipsychotics	**Aripiprazole Lauroxil**	X		
Selective Norepinephrine Reuptake Inhibitor	**Venlafaxine**	X		
Selective Norepinephrine Reuptake Inhibitor	**Atomoxetine**	X		
SSRIs	**Citalopram**			X
SSRIs	**Escitalopram**			X
SSRIs	**Fluvoxamine**	X		
SSRIs	**Paroxetine**	X		
SSRIs	**Sertraline**			X
SSRIs	**Vortioxetine**	X		
Tricyclic Antidepressants	**Clomipramine**	X		
Tricyclic Antidepressants	**Desipramine**	X		

Drug Class	Drug	Actionable	Informative	Standard Precaution
Tricyclic Antidepressants	**Doxepin**	X		
Tricyclic Antidepressants	**Imipramine**	X		
Tricyclic Antidepressants	**Nortriptyline**	X		
Tricyclic Antidepressants	**Trimipramine**	X		
Tricyclic Antidepressants	**Amitriptyline**	X		

Other

Drug Class	Drug	Actionable	Informative	Standard Precaution
Antihistamine	**Meclizine**	X		
Enzyme Inhibitors	**Eliglustat**	X		
H3 Blockers	**Pitolisant**	X		

Actionable Results

These results are based on **actionable guidelines** that your physician may use to adjust your dosages or medications. These guidelines are controlled by CPIC® (the Clinical Pharmacogenetics Implementation Consortium) and the FDA (US Food and Drug Administration). No adjustments should be made before consulting your physician. If your medication(s) do not appear on this list, then they are not currently known to have an actionable impact on your medication planning based on this test.

Actionable Results: Cardiology

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Atorvastatin	Statins	*SLCO1B1*	Decreased Function rs4149056 CT	Based on the genotype result, this patient is predicted to have decreased SLCO1B1 function. This patient may be at risk for an adverse response to medications that are affected by SLCO1B1. To avoid an untoward drug response, dose adjustments or alternative therapies may be necessary for medications affected by SLCO1B1.	CPIC (PMID 35152405)
Fluvastatin	Statins	*SLCO1B1*	Decreased Function rs4149056 CT	Based on the genotype result, this patient is predicted to have decreased SLCO1B1 function. This patient may be at risk for an adverse response to medications that are affected by SLCO1B1. To avoid an untoward drug response, dose adjustments or alternative therapies may be necessary for medications affected by SLCO1B1.	CPIC (PMID 35152405)
Lovastatin	Statins	*SLCO1B1*	Decreased Function rs4149056 CT	Based on the genotype result, this patient is predicted to have decreased SLCO1B1 function. This patient may be at risk for an adverse response to medications that are affected by SLCO1B1. To avoid an untoward drug response, dose adjustments or alternative therapies may be necessary for medications affected by SLCO1B1.	CPIC (PMID 35152405)
Pitavastatin	Statins	*SLCO1B1*	Decreased Function rs4149056 CT	Based on the genotype result, this patient is predicted to have decreased SLCO1B1 function. This patient may be at risk for an adverse response to medications that are affected by SLCO1B1. To avoid an untoward drug response, dose adjustments or alternative therapies may be necessary for medications affected by SLCO1B1.	CPIC (PMID 35152405)
Pravastatin	Statins	*SLCO1B1*	Decreased Function rs4149056 CT	Based on the genotype result, this patient is predicted to have decreased SLCO1B1 function. This patient may be at risk for an adverse response to medications that are affected by SLCO1B1. To avoid an untoward drug response, dose adjustments or alternative therapies may be necessary for medications affected by SLCO1B1.	CPIC (PMID 35152405)
Propafenone	Antiarrhythmic Agents	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Rosuvastatin	Statins	*SLCO1B1*	Decreased Function rs4149056 CT	Based on the genotype result, this patient is predicted to have decreased SLCO1B1 function. This patient may be at risk for an adverse response to medications that are affected by SLCO1B1. To avoid an untoward drug response, dose adjustments or alternative therapies may be necessary for medications affected by SLCO1B1.	CPIC (PMID 35152405)
Simvastatin	Statins	*SLCO1B1*	Decreased Function rs4149056 CT	Based on the genotype result, this patient is predicted to have decreased SLCO1B1 function. This patient may be at risk for an adverse response to medications that are affected by SLCO1B1. To avoid an untoward drug response, dose adjustments or alternative therapies may be necessary for medications affected by SLCO1B1.	CPIC (PMID 35152405)
Warfarin	Anticoagulants	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA, CPIC (PMID 21900891, 28198005)
Fluvastatin	Statins	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	CPIC (PMID: 35152405)
Warfarin	Anticoagulants	*CYP4F2*	Other Abnormal rs2108622 TT	Based on the genotype result, this patient may require an altered dose for medications impacted by CYP4F2 genotype.	FDA, CPIC (PMID 21900891, 28198005)

Actionable Results: Immunology

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Siponimod	Immune Modulatory Agents	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA

Actionable Results: Infectious Disease

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Efavirenz	Antiretrovirals	*CYP2B6*	Intermediate Metabolizer *1/*6	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2B6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2B6. To avoid an untoward drug response, dose adjustments or alternative therapeutic agents may be necessary for medications metabolized by CYP2B6.	FDA, CPIC (PMID 31006110)
Peginterferon Alfa-2A	Antivirals	*IFNL4*	Other Abnormal rs12979860 CT	Based on the genotype result this patient is at increased risk for an unfavorable response to medications associated with IFNL4 genotype status.	CPIC (PMID: 24096968)
Peginterferon Alfa-2B	Antivirals	*IFNL4*	Other Abnormal rs12979860 CT	Based on the genotype result this patient is at increased risk for an unfavorable response to medications associated with IFNL4 genotype status.	CPIC (PMID: 24096968)
Ribavirin	Antivirals	*IFNL4*	Other Abnormal rs12979860 CT	Based on the genotype result this patient is at increased risk for an unfavorable response to medications associated with IFNL4 genotype status.	CPIC (PMID: 24096968)

Actionable Results: Neurology

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Deutetrabenazine	Central Monamine Depleting Agents	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA,
Fosphenytoin	Anticonvulsants	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA
Phenytoin	Anticonvulsants	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	CPIC (PMID: 25099164, 32779747)

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Tetrabenazine	Monamine Depletors	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Valbenazine	VMAT2 Inhibitor	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA

Actionable Results: Oncology

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Dronabinol	Antiemetics	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA
Erdafitinib	Antineoplastic Agents	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA
Gefitinib	Antineoplastic Agents	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Metoclopramide	Antiemetics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Ondansetron	Antiemetics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 28002639)
Tamoxifen	Antiestrogens	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 29385237)
Tropisetron	Antiemetics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 28002639)

Actionable Results: Pain Management

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Celecoxib	Non-Steroidal Anti-Inflammatory Drugs	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA, CPIC (PMID: 32189324)
Codeine	Opioids	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA, CPIC (PMID: 22205192, 24458010, 33387367)
Flurbiprofen	Non-Steroidal Anti-Inflammatory Drugs	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA, CPIC (PMID: 32189324)

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Hydrocodone	Opioids	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 33387367)
Ibuprofen	Non-Steroidal Anti-Inflammatory Drugs	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	CPIC (PMID: 32189324)
Lornoxicam	Non-Steroidal Anti-Inflammatory Drugs	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	CPIC (PMID: 32189324)
Lofexidine	Central Alpha Adrenergic Agonists	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Meloxicam	Non-Steroidal Anti-Inflammatory Drugs	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA, CPIC (PMID: 32189324)
Oliceridine	Opioids	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Piroxicam	Non-Steroidal Anti-Inflammatory Drugs	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	FDA, CPIC (PMID: 32189324)
Tenoxicam	Non-Steroidal Anti-Inflammatory Drugs	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	CPIC (PMID: 32189324)

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Tramadol	Opioids	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA, CPIC (PMID: 33387367)

Actionable Results: Psychiatry

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Brexpiprazole	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Clomipramine	Tricyclic Antidepressants	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 27997040)
Clozapine	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Desipramine	Tricyclic Antidepressants	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 27997040)

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Doxepin	Tricyclic Antidepressants	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 27997040)
Fluvoxamine	SSRIs	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 25974703)
Iloperidone	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Imipramine	Tricyclic Antidepressants	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 27997040)
Nortriptyline	Tricyclic Antidepressants	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 27997040)
Paroxetine	SSRIs	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 25974703)

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Pimozide	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Thioridazine	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Trimipramine	Tricyclic Antidepressants	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 27997040)
Venlafaxine	Selective Norepinephrine Reuptake Inhibitor	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Vortioxetine	SSRIs	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Amitriptyline	Tricyclic Antidepressants	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 27997040)

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Aripiprazole	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Aripiprazole Lauroxil	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Atomoxetine	Selective Norepinephrine Reuptake Inhibitor	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	CPIC (PMID: 30801677)

Actionable Results: Other

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Eliglustat	Enzyme Inhibitors	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA
Meclizine	Antihistamine	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Pitolisant	H3 Blockers	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	FDA

Informative Results

These results have implications for your metabolism of certain drugs, however, **no actionable guidelines** are currently associated with them (in contrast to your "Actionable Results" above). It is possible to have no results for this section.

Informative Results: Cardiology

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Acenocoumarol	Anticoagulants	*CYP2C9*	Intermediate Metabolizer *1/*3	Based on the genotype result, this patient is predicted to be a CYP2C9 intermediate metabolizer. This patient may be at risk for an adverse response to medications that are impacted by CYP2C9 genotype.	PharmGKB 1B
Flecainide	Antiarrhythmic Agents	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	PharmGKB 1A
Metoprolol	Beta Blocker	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	PharmGKB 1A
Acenocoumarol	Anticoagulants	*CYP4F2*	Other Abnormal rs2108622 TT	Based on the genotype result, this patient may require an altered dose for medications impacted by CYP4F2 genotype.	PharmGKB 2A

Informative Results: Infectious Disease

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Nevirapine	Antivirals	*CYP2B6*	Intermediate Metabolizer *1/*6	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2B6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2B6. To avoid an untoward drug response, dose adjustments or alternative therapeutic agents may be necessary for medications metabolized by CYP2B6.	PharmGKB 2A

Informative Results: Pain Management

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Methadone	Opioids	*CYP2B6*	Intermediate Metabolizer *1/*6	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2B6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2B6. To avoid an untoward drug response, dose adjustments or alternative therapeutic agents may be necessary for medications metabolized by CYP2B6.	PharmGKB 2A

Informative Results: Psychiatry

Drug (Generic)	Drug Class	Gene	Genotype/ Diplotype (Phenotype)	Interpretation	Source
Bupropion	Antidepressants	*CYP2B6*	Intermediate Metabolizer *1/*6	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2B6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2B6. To avoid an untoward drug response, dose adjustments or alternative therapeutic agents may be necessary for medications metabolized by CYP2B6.	PharmGKB 2A
Haloperidol	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	PharmGKB 1A
Risperidone	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	PharmGKB 1A
Zuclopenthixol	Antipsychotics	*CYP2D6*	Intermediate Metabolizer *4/*41	Based on the genotype result this patient is predicted to be an intermediate metabolizer of CYP2D6 substrates. This patient may be at risk for an adverse or poor response to medications that are metabolized by CYP2D6. To avoid an untoward drug response, dose adjustments may be necessary for medications metabolized by CYP2D6.	PharmGKB 1A

Full Genetic Results

The following table includes all genes tested, along with your genotype for each, for your reference. "N/A" indicates that a specific phenotype is not reported for that result.

Gene	Phenotype	Genotype/Diplotype
BCHE	N/A	rs1799807 TT
CYP2B6	Intermediate Metabolizer	*1/*6
CYP2C19	N/A	*1/*1
CYP2C9	Intermediate Metabolizer	*1/*3
CYP2D6	Intermediate Metabolizer	*4/*41
CYP3A5	Poor Metabolizer	*3/*3
CYP4F2	Other Abnormal	rs2108622 TT
DPYD	N/A	*1/*1
G6PD	N/A	rs1050828 C(C)
G6PD	N/A	rs5030868 G(G)
HLA-B	N/A	rs144012689 TT
HLA-B	N/A	rs2395029 TT
IFNL4	Other Abnormal	rs12979860 CT
NAT2	N/A	*4/*4
NUDT15	N/A	*1/*1
RYR1	N/A	rs111888148 GG
RYR1	N/A	rs112563513 GG
RYR1	N/A	rs118192116 CC
RYR1	N/A	rs118192122 GG
RYR1	N/A	rs118192124 CC
RYR1	N/A	rs118192161 CC
RYR1	N/A	rs118192162 AA
RYR1	N/A	rs118192163 GG
RYR1	N/A	rs118192167 AA
RYR1	N/A	rs118192168 GG
RYR1	N/A	rs118192170 TT
RYR1	N/A	rs118192172 CC
RYR1	N/A	rs118192175 CC
RYR1	N/A	rs118192176 GG
RYR1	N/A	rs118192177 CC
RYR1	N/A	rs118192178 CC
RYR1	N/A	rs121918592 GG
RYR1	N/A	rs121918593 GG

Gene	Phenotype	Genotype/Diplotype
RYR1	N/A	rs121918594 GG
RYR1	N/A	rs121918595 CC
RYR1	N/A	rs121918596 WT/WT
RYR1	N/A	rs144336148 GG
RYR1	N/A	rs1801086 GG
RYR1	N/A	rs193922747 TT
RYR1	N/A	rs193922748 CC
RYR1	N/A	rs193922753 GG
RYR1	N/A	rs193922762 CC
RYR1	N/A	rs193922764 CC
RYR1	N/A	rs193922768 CC
RYR1	N/A	rs193922770 CC
RYR1	N/A	rs193922772 GG
RYR1	N/A	rs193922802 GG
RYR1	N/A	rs193922803 CC
RYR1	N/A	rs193922807 GG
RYR1	N/A	rs193922809 GG
RYR1	N/A	rs193922816 CC
RYR1	N/A	rs193922818 GG
RYR1	N/A	rs193922832 GG
RYR1	N/A	rs193922843 GG
RYR1	N/A	rs193922876 CC
RYR1	N/A	rs193922878 CC
RYR1	N/A	rs28933396 GG
RYR1	N/A	rs28933397 CC
RYR1	N/A	rs63749869 GG
SLCO1B1	Decreased Function	rs4149056 CT
TPMT	N/A	*1/*1
UGT1A1	N/A	*1/*1
VKORC1	N/A	rs9923231 CC

VARIANTS TESTED

Only the specific variants listed in this report were tested for the genes analyzed.

These results should be interpreted in the context of this individual's clinical findings, biochemical profile, current medication regimen, and family history. Changes to a patient's medication should only be made after consultation with the ordering physician and/or clinical pharmacist.

VARIANTS:

BCHE (rs1799807), *CYP2B6* (*1,*4,*5,*6,*7,*8,*9,*13,*16,*18,*22), *CYP2C19* (*1,*2,*3,*17,*4,*5,*6,*7,*8,*9,*10,*35), *CYP2C9* (*1,*2,*3,*5,*6,*8,*11), *CYP2D6* (*1,*1x2,*2,*2x2,*3,*4,*4x2,*5,*6,*7,*8,*9,*10,*10x2,*11,*12,*14,*15,*17,*19,*20,*21,*29,*31,*35,*36,*36x2,*40,*41,*45,*46), *CYP3A5* (*1,*3,*6,*7), *CYP4F2* (rs2108622), *DPYD* (*1,*2A,*13,rs67376798), *G6PD* (rs5030868,rs1050828), *HLA-B* (HLA-B*15:02 (rs144012689 as proxy),HLA-B*57:01 (rs2395029 as proxy)), *IFNL4* (rs12979860), *NAT2* (*4,*5,*6,*7,*14), *NUDT15* (*1,*2,*3,*6,*9), *RYR1* (>= 43 known pathogenic variants (ask lab for details)), *SLCO1B1* (rs4149056 (found in *5,*15,and *17 alleles)), *TPMT* (*1,*2,*3A,*3B,*3C,*4), *UGT1A1* (*6,*80 (proxy for *28 and *37 alleles)), *VKORC1* (rs9923231)

METHODS

Genomic DNA was isolated from the submitted specimen indicated above (if cellular material was submitted). DNA was barcoded, and enriched for the coding exons of targeted genes using hybrid capture technology. Prepared DNA libraries were then sequenced using a Next Generation Sequencing technology. Variant calling, copy number analysis, and diplotype analysis were performed using validated methods. Variants reported as "variant allele(allele)" indicate a homozygous female or hemizygous male for an X-linked marker. Bioinformatics: The Fulgent Germline v2019.2 pipeline was used to analyze this specimen.

LIMITATIONS

These test results and variant interpretation are based on the proper identification of the submitted specimen, accuracy of any stated familial relationships, and use of the correct human reference sequences at the queried loci. In very rare instances, errors may result due to mix-up or co-mingling of specimens. Positive results do not imply that there are no other contributors, genetic or otherwise, to this individual's phenotype, and negative results do not rule out a genetic cause for the indication for testing. Annotations for FDA, PharmGKB, and CPIC guidelines were updated most recently on 8/1/2022. Official gene names change over time. Fulgent uses the most up to date gene names based on HUGO Gene Nomenclature Committee (https://www.genenames.org) recommendations. If the gene name on report does not match that of ordered gene, please contact the laboratory and details can be provided. Result interpretation is based on the available clinical and family history information for this individual, collected published information, and Alamut annotation available at the time of reporting. This assay is designed and validated for detection of germline variants only. It is not designed or validated for the detection of low-level mosaicism or somatic mutations. This assay will not detect certain types of genomic aberrations such as translocations, inversions, or repeat expansions (eg. trinucleotide or hexanucleotide repeat expansion). Analysis and reporting is limited to the diplotypes/markers explicitly listed on this report. This test cannot rule out the possibility that the tested individual has a rare or uncharacterized phenotype for genes on this panel.

SIGNATURE

Zhenbin Chen, Ph.D., CGMB, FACMG on **12/27/2023 04:10 PM PST**
Electronically signed

DISCLAIMER

This test was developed and its performance characteristics determined by Fulgent Genetics (CLIA: 05D2043189, CAP: 8042697 | 4399 Santa Anita Ave, El Monte, CA, 91731 | P: 626-350-0537 | F: 626-454-1667). It has not been cleared or approved by the FDA. The laboratory is regulated under CLIA as qualified to perform high-complexity testing. This test is used for clinical purposes. It should not be regarded as investigational or for research. Since genetic variation, as well as systematic and technical factors, can affect the accuracy of testing, the results of testing should always be interpreted in the context of clinical and familial data. For assistance with interpretation of these results, individuals may contact PWNHealth at (888) 494-7333 or gc@pwnhealth.com. It is recommended that patients receive appropriate genetic counseling to explain the implications of the test result, including its residual risks, uncertainties, and reproductive or medical options.