Medication Optimization Pharmacogenomics Report

Name: Doe, John

DOB: 01/01/1950

Gender: M

Report ID: PGX000001

Sample Type: Buccal Swab

Report Date: 05/08/2025

Received: 05/05/2025

SAMPLE REPORT

Gene	Genotype	Phenotype	Cautionary Medications*
CYP2C9	*1/*1	normal	Warfarin
SLCO1B1	*1/*1	normal	
CYP2C19	*1/*17	rapid	Amitriptyline, Citalopram, Clomipramine, Doxepin, Escitalopram, Imipramine, Trimipramine, Voriconazole
CYP2B6	*1/*6	intermediate	Efavirenz
CYP3A5	*3/*3	poor	
CYP3A4	*1/*22	intermediate	
CYP2D6	*4/*10	intermediate	Amitriptyline, Amoxapine, Atomoxetine, Clomipramine, Codeine, Desipramine, Doxepin, Eliglustat, Flecainide, Imipramine, Meclizine, Metoprolol, Nortriptyline, Paroxetine, Pimozide, Propafenone, Tamoxifen, Tramadol, Trimipramine, Zuclopenthixol
F2	wt/wt	negative	
F5	wt/wt	negative	
VKORC1	*1/*2	intermediate	Warfarin
NUDT15	*1/*1	normal	Azathioprine, Mercaptopurine, Thioguanine
G6PD	b(reference)/b(reference)	normal	
ABCG2	g/g	normal	
CYP4F2	*1/*1	normal	Warfarin
CYP2C	g/g	normal	

What is this card?

This card contains information that can help inform your healthcare providers about how your body processes or reacts to specific medications. Please keep this with you at all times.

DO NOT stop or change how you take your medications without speaking with a healthcare professional.

For use by healthcare professionals only

The Clinical Pharmacology physician can be reached by calling the Foothills Medical Centre switchboard at 403-944-1110 and asking to speak with the Clinical Pharmacology physician on call. THIS PHONE NUMBER IS FOR USE BY HEALTHCARE PROVIDERS ONLY.

For more information, visit
sequence2script.com

Personal Pharmacogenetics Information card

For more information, visit:
sequence2script.com

Patient Name: John Doe

Date of Issue: 05/08/2025

Wallet Card Instructions

To the Provider: To assist in sharing these test results with your patient, please give this page of the report to you patient. This page includes a wallet card, which the patient can share with their other healthcare providers (e.g., pharmacists).

To the Patient: Your doctor recently ordered a pharmacogenetic test for you. Pharmacogenetic testing is a special type of genetic test that can help your doctor and pharmacist:
(1) Select medications that are the best match for you.
(2) Identify the dose of medication right for you.
(3) Estimate your risk for potentially serious side effects.

Pharmacogenetic testing has limitations worth noting:
(a) Testing only looks at common gene differences. Rare gene differences that may account for the way you react to medications are not tested;
(b) Many factors may influence the way you react to medications. Things like your age, weight, other medications and other medical conditions. Your doctor will need to consider these factors along with your test results to advise on the best course of action; and
(c) Your results cannot be used to guide medication selection or dosing of your family members.

Your test results are listed in the wallet card on this page. You may want to cut the card out and share it with your doctors and pharmacists.

Patient Genetic Results

Gene	Genotype	Activity Score	Phenotype	Phenotype adjusted for concomitant medications*	Additional Comments
CYP2C9	*1/*1	2.00	normal	normal	None
SLCO1B1	*1/*1		normal	normal	None
CYP2C19	*1/*17		rapid	rapid	None
CYP2B6	*1/*6		intermediate	intermediate	None
CYP3A5	*3/*3		poor	poor	None
CYP3A4	*1/*22		intermediate	intermediate	None
CYP2D6	*4/*10	0.25	intermediate	intermediate	None
F2	wt/wt		negative	negative	None
F5	wt/wt		negative	negative	None
VKORC1	*1/*2		intermediate	intermediate	None
NUDT15	*1/*1		normal	normal	None
G6PD	b(reference)/b(reference)		normal	normal	None
ABCG2	g/g		normal	normal	None
CYP4F2	*1/*1		normal	normal	None
CYP2C	g/g		normal	normal	None

*Phenotype adjusted for concomitant medications is based on the presence of inhibitors and inducers. See the "Regarding Phenotype Adjustment" section at the end of the report for full details.

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Medications Summary

Therapeutic Area	Standard Precautions Typical risk for indicated use. Follow standard dosing guidelines	Action May Be Required Adjustment to standard dose or alternative medicine may be required
Psychiatry	Amphetamine Aripiprazole Brexpiprazole Clobazam Clonidine Clozapine Dextromethorphan-Bupropion Diazepam Duloxetine Fluoxetine Fluphenazine Fluvoxamine Haloperidol Iloperidone Lofexidine Methylphenidate Mirtazapine Moclobemide	Amitriptyline Amoxapine Atomoxetine Citalopram Clomipramine Desipramine Doxepin Escitalopram Imipramine Nortriptyline Paroxetine Pimozide Trimipramine Zuclopenthixol

Therapeutic Area	Standard Precautions Typical risk for indicated use. Follow standard dosing guidelines	Action May Be Required Adjustment to standard dose or alternative medicine may be required
	Olanzapine Perphenazine Quetiapine Risperidone Sertraline Thioridazine Venlafaxine Viloxazine Vortioxetine	
Cardiology	Acenocoumarol Amiodarone Atenolol Atorvastatin Bisoprolol Carvedilol Clopidogrel Fluvastatin Lovastatin Mavacamten Nebivolol Pitavastatin Prasugrel Pravastatin Propranolol Rosuvastatin Simvastatin Ticagrelor	Flecainide Metoprolol Propafenone Warfarin
Dermatology	Abrocitinib	
Endocrinology	Chlorpropamide Glibenclamide Glimepiride Glipizide Nateglinide Tolazamide Tolbutamide	Eliglustat
Gastroenterology	Dexlansoprazole Dronabinol Esomeprazole Lansoprazole Metoclopramide Omeprazole Ondansetron Pantoprazole Rabeprazole	

Therapeutic Area	Standard Precautions Typical risk for indicated use. Follow standard dosing guidelines	Action May Be Required Adjustment to standard dose or alternative medicine may be required
	Tropisetron	
Hematology	Avatrombopag Eltrombopag Lusutrombopag Methylene Blue	
Immunology	Cevimeline Tacrolimus	
Infectious Disease	Ceftriaxone Dapsone Hydroxychloroquine Nalidixic Acid Nitrofurantoin Primaquine Tafenoquine	Efavirenz Voriconazole
Neurology	Brivaracetam Deutetrabenazine Donepezil Galantamine Pitolisant Tetrabenazine Valbenazine	
Oncology	Erdafitinib Gefitinib Rasburicase	Tamoxifen
Other	Siponimod Toluidine Blue	Meclizine
Pain	Aspirin Carisoprodol Celecoxib Elagolix Flurbiprofen Hydrocodone Ibuprofen Lornoxicam Meloxicam Naproxen Oliceridine Oxycodone Piroxicam Tenoxicam	Codeine Tramadol
Rheumatology	Pegloticase	
Urology	Darifenacin Fesoterodine Mirabegron	

Therapeutic Area	Standard Precautions Typical risk for indicated use. Follow standard dosing guidelines	Action May Be Required Adjustment to standard dose or alternative medicine may be required
	Tamsulosin Tolterodine	

Current Medications

Medication Name	Description	Genes	Recommendation	Strength of Recommendation	Source	Pathway
No current medications						

*Note: Inhibitor and inducer information was based on the Drug Interactions Flockhart Table

Medications Being Considered

Medication Name	Therapeutic Area	Genes	Recommendation	Strength of Recommendation	Source	Pathway
No current medications						

The strength of a recommendation is based exclusively on pharmacogenetic information published in guidelines. They do not reflect the strength of a recommendation based on phenotypes that have been adjusted due to the presence of concomitant inhibitors or inducers.

Medication Recommendations

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
Psychiatry	Amitriptyline	CYP2C19 CYP2D6	Consider alternative drug not metabolized by CYP2C19.	OPTIONAL	CPIC	pathway
Psychiatry	Amoxapine	CYP2D6	May alter systemic concentrations.	OPTIONAL	FDA	pathway
Psychiatry	Amphetamine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Psychiatry	Aripiprazole	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Atomoxetine	CYP2D6	CHILD: Initiate with a dose of 0.5 mg/kg/day and if no clinical response and in the absence of adverse	MODERATE	CPIC	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			events after 2 weeks, consider a proportional dose increase. If unacceptable side effects are present at any time, consider a reduction in dose. ADULT: Initiate with a dose of 40 mg/day and if no clinical response and in the absence of adverse events after 2 weeks increase dose to 80 mg/day. If response is inadequate after 2 weeks consider a proportional dose increase. If unacceptable side effects are present at any time, consider a reduction in dose.			
Psychiatry	Brexpiprazole	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Citalopram	CYP2C19	Initiate therapy with recommended starting dose. If patient does not adequately respond to recommended maintenance dosing, consider titrating to a higher maintenance dose or switching to a clinically appropriate alternative antidepressant not predominantly metabolized by CYP2C19.	OPTIONAL	CPIC	pathway
Psychiatry	Clobazam	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Psychiatry	Clomipramine	CYP2C19 CYP2D6	Consider alternative drug not metabolized by CYP2C19.	OPTIONAL	CPIC	pathway
Psychiatry	Clonidine	CYP2D6	No action required. Initiate	N/A	DPWG	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			therapy with recommended starting dose.			
Psychiatry	Clozapine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Desipramine	CYP2D6	Consider a 25% reduction of recommended starting dose. Utilize therapeutic drug monitoring to guide dose adjustments.	OPTIONAL	CPIC	pathway
Psychiatry	Dextromethorphan-Bupropion	CYP2D6	Use according to the product label	N/A	FDA	pathway
Psychiatry	Diazepam	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Psychiatry	Doxepin	CYP2C19 CYP2D6	Consider alternative drug not metabolized by CYP2C19.	OPTIONAL	CPIC	pathway
Psychiatry	Duloxetine	CYP2D6	No recommendation due to minimal evidence regarding tolerability or efficacy.	N/A	CPIC	pathway
Psychiatry	Escitalopram	CYP2C19	Initiate therapy with recommended starting dose. If patient does not adequately respond to recommended maintenance dosing, consider titrating to a higher maintenance dose or switching to a clinically appropriate alternative antidepressant not predominantly metabolized by CYP2C19.	OPTIONAL	CPIC	pathway
Psychiatry	Fluoxetine	CYP2D6	No action recommended based on genotype for fluoxetine because of minimal evidence regarding the impact on efficacy or side effects.	N/A	CPIC	pathway
Psychiatry	Fluphenazine	CYP2D6	No action required. Initiate	N/A	DPWG	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			therapy with recommended starting dose.			
Psychiatry	Fluvoxamine	CYP2D6	Initiate therapy with recommended starting dose.	MODERATE	CPIC	pathway
Psychiatry	Haloperidol	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Iloperidone	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Psychiatry	Imipramine	CYP2C19 CYP2D6	Consider alternative drug not metabolized by CYP2C19.	OPTIONAL	CPIC	pathway
Psychiatry	Lofexidine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Psychiatry	Methylphenidate	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Mirtazapine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Moclobemide	CYP2C19	No recommendation due to minimal evidence regarding tolerability or efficacy.	N/A	DPWG	pathway
Psychiatry	Nortriptyline	CYP2D6	Consider a 25% reduction of recommended starting dose. Utilize therapeutic drug monitoring to guide dose adjustments.	MODERATE	CPIC	pathway
Psychiatry	Olanzapine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Paroxetine	CYP2D6	Consider a lower starting dose and slower titration	OPTIONAL	CPIC	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			schedule as compared to normal metabolizers.			
Psychiatry	Perphenazine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Psychiatry	Pimozide	CYP2D6	Use no more than 80% of the standard maximum dose. For adults, 16 mg/day. For children, 0.08 mg/kg per day to a maximum of 3 mg/day.	OPTIONAL	DPWG	pathway
Psychiatry	Quetiapine	CYP3A4	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Risperidone	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Psychiatry	Sertraline	CYP2C19 CYP2B6	Initiate therapy with recommended starting dose.	MODERATE	CPIC	pathway
Psychiatry	Thioridazine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Psychiatry	Trimipramine	CYP2C19 CYP2D6	Consider alternative drug not metabolized by CYP2C19 (e.g., nortriptyline).	OPTIONAL	CPIC	pathway
Psychiatry	Venlafaxine	CYP2D6	No action recommended based on genotype for venlafaxine because of minimal evidence regarding the impact on efficacy or side effects.	N/A	CPIC	pathway
Psychiatry	Viloxazine	CYP2D6	Use according to the product label	N/A	FDA	pathway
Psychiatry	Vortioxetine	CYP2D6	Initiate therapy with recommended starting dose.	MODERATE	CPIC	pathway
Psychiatry	Zuclopenthixol	CYP2D6	Reduce dose by 25% or select alternative drug not	OPTIONAL	DPWG	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			metabolized by CYP2D6.			
Cardiology	Acenocoumarol	VKORC1	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Cardiology	Amiodarone	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Cardiology	Atenolol	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Cardiology	Atorvastatin	SLCO1B1	Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	STRONG	CPIC	pathway
Cardiology	Bisoprolol	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Cardiology	Carvedilol	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Cardiology	Clopidogrel	CYP2C19	If considering clopidogrel, use at standard dose (75 mg/day)	STRONG	CPIC	pathway
Cardiology	Flecainide	CYP2D6	Indications other than diagnosis of Brugada syndrome: reduce the dose to 75% of the standard dose and record an ECG.	OPTIONAL	DPWG	pathway
Cardiology	Fluvastatin	SLCO1B1 CYP2C9	Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	STRONG	CPIC	pathway
Cardiology	Lovastatin	SLCO1B1	Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	STRONG	CPIC	pathway
Cardiology	Mavacamten	CYP2C19	The recommended starting dose is 5 mg orally	STRONG	FDA	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			once daily. The maximum dose is 15 mg once daily.			
Cardiology	Metoprolol	CYP2D6	If a gradual reduction in heart rate is desired, or in the event of symptomatic bradycardia, increase the dose in smaller steps and/or prescribe no more than 50% of the standard dose.	OPTIONAL	DPWG	pathway
Cardiology	Nebivolol	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Cardiology	Pitavastatin	SLCO1B1	Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	STRONG	CPIC	pathway
Cardiology	Prasugrel	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Cardiology	Pravastatin	SLCO1B1	Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	STRONG	CPIC	pathway
Cardiology	Propafenone	CYP2D6	Perform an ECG and be alert to reduced efficacy of the therapy or choose an alternative (e.g., sotalol, disopyramide, quinidine and amiodarone).	OPTIONAL	DPWG	pathway
Cardiology	Propranolol	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Cardiology	Rosuvastatin	SLCO1B1 ABCG2	Prescribe desired starting dose and adjust doses of rosuvastatin based on disease-specific and specific population guidelines.	STRONG	CPIC	pathway
Cardiology	Simvastatin	SLCO1B1	Prescribe desired starting dose and adjust doses based on disease-specific	STRONG	CPIC	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			guidelines.			
Cardiology	Ticagrelor	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Cardiology	Warfarin	CYP2C9 VKORC1 CYP4F2	Calculate warfarin dose using a validated pharmacogenetic algorithm (e.g., http://warfarindosing.org).	STRONG	N/A	N/A
Dermatology	Abrocitinib	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Endocrinology	Chlorpropamide	G6PD	Use according to the product label	N/A	FDA	pathway
Endocrinology	Eliglustat	CYP2D6	Coadministration with strong CYP3A inhibitors is contraindicated. FDA recommends 84mg orally twice daily.	STRONG	DPWG	pathway
Endocrinology	Glibenclamide	G6PD	Use according to the product label	STRONG	FDA	pathway
Endocrinology	Glimepiride	G6PD	Use according to the product label	N/A	FDA	pathway
Endocrinology	Glipizide	G6PD	Use according to the product label	N/A	FDA	pathway
Endocrinology	Nateglinide	CYP2C9	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Endocrinology	Tolazamide	G6PD	Use according to the product label	N/A	FDA	pathway
Endocrinology	Tolbutamide	G6PD	Use according to the product label	N/A	FDA	pathway
Gastroenterology	Dexlansoprazole	CYP2C19	Initiate standard starting daily dose. Consider increasing dose by 50-100% for the treatment of H. pylori infection and erosive esophagitis. Daily dose may be given in divided doses. Monitor for	OPTIONAL	CPIC	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			efficacy			
Gastroenterology	Dronabinol	CYP2C9	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Gastroenterology	Esomeprazole	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	CPIC	pathway
Gastroenterology	Lansoprazole	CYP2C19	Initiate standard starting daily dose. Consider increasing dose by 50-100% for the treatment of H. pylori infection and erosive esophagitis. Daily dose may be given in divided doses. Monitor for efficacy.	MODERATE	CPIC	pathway
Gastroenterology	Metoclopramide	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Gastroenterology	Omeprazole	CYP2C19	Initiate standard starting daily dose. Consider increasing dose by 50-100% for the treatment of H. pylori infection and erosive esophagitis. Daily dose may be given in divided doses. Monitor for efficacy.	MODERATE	CPIC	pathway
Gastroenterology	Ondansetron	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	CPIC	pathway
Gastroenterology	Pantoprazole	CYP2C19	Initiate standard starting daily dose. Consider increasing dose by 50-100% for the treatment of H. pylori infection and erosive esophagitis. Daily dose may be given in	MODERATE	CPIC	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			divided doses. Monitor for efficacy.			
Gastroenterology	Rabeprazole	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	CPIC	pathway
Gastroenterology	Tropisetron	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	CPIC	pathway
Hematology	Avatrombopag	F5 F2	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Hematology	Eltrombopag	F5	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Hematology	Lusutrombopag	F5 F2	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Hematology	Methylene Blue	G6PD	Use according to the product label	STRONG	CPIC	pathway
Immunology	Cevimeline	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Immunology	Tacrolimus	CYP3A5	Initiate therapy with standard recommended dose. Use therapeutic drug monitoring to guide dose adjustments.	STRONG	CPIC	pathway
Infectious Disease	Ceftriaxone	G6PD	Use according to the product label	N/A	FDA	pathway
Infectious Disease	Dapsone	G6PD	Use according to the product label	STRONG	CPIC	pathway
Infectious Disease	Efavirenz	CYP2B6	Consider initiating efavirenz with decreased dose of 400 mg/day.	MODERATE	CPIC	pathway
Infectious Disease	Hydroxychloroquine	G6PD	Use according to the product label	N/A	FDA	pathway
Infectious Disease	Nalidixic Acid	G6PD	Use according to the product label	N/A	FDA	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
Infectious Disease	Nitrofurantoin	G6PD	Use according to the product label	STRONG	CPIC	pathway
Infectious Disease	Primaquine	G6PD	Use according to the product label	STRONG	CPIC	pathway
Infectious Disease	Tafenoquine	G6PD	Use according to the product label	STRONG	CPIC	pathway
Infectious Disease	Voriconazole	CYP2C19	Choose an alternative agent that is not dependent on CYP2C19 metabolism (e.g., isavuconazole, liposomal amphotericin B, posaconazole).	MODERATE	CPIC	pathway
Neurology	Brivaracetam	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Neurology	Deutetrabenazine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Neurology	Donepezil	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Neurology	Galantamine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Neurology	Pitolisant	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Neurology	Tetrabenazine	CYP2D6	The maximum recommended single dose is 37.5 mg and should not exceed 100 mg/day.	STRONG	FDA	pathway
Neurology	Valbenazine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Oncology	Erdafitinib	CYP2C9	No action required. Initiate therapy with recommended starting	N/A	FDA	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			dose.			
Oncology	Gefitinib	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Oncology	Rasburicase	G6PD	Use according to the product label	STRONG	CPIC	pathway
Oncology	Tamoxifen	CYP2D6	Consider alternative hormonal therapy such as an aromatase inhibitor for postmenopausal women or aromatase inhibitor along with ovarian function suppression in premenopausal women. If aromatase inhibitor use is contraindicated, consider a higher but FDA approved tamoxifen dose (40 mg/day). Avoid use of CYP2D6 inhibitors.	MODERATE	CPIC	pathway
Other	Meclizine	CYP2D6	May affect systemic concentrations. Monitor for adverse reactions.	MODERATE	FDA	pathway
Other	Siponimod	CYP2C9	The recommended maintenance dosage is 2 mg per day.	MODERATE	FDA	pathway
Other	Toluidine Blue	G6PD	Use according to the product label	STRONG	CPIC	pathway
Pain	Aspirin	CYP2C9	No recommendation due to minimal evidence regarding tolerability or efficacy.	N/A	CPIC	pathway
Pain	Carisoprodol	CYP2C19	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Pain	Celecoxib	CYP2C9	Initiate therapy with recommended starting dose.	STRONG	CPIC	pathway
Pain	Codeine	CYP2D6	Use codeine label recommended age- or weight-specific dosing. If no response and opioid use is warranted, consider	MODERATE	CPIC	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			a non-tramadol opioid.			
Pain	Elagolix	SLCO1B1	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Pain	Flurbiprofen	CYP2C9	Initiate therapy with recommended starting dose.	STRONG	CPIC	pathway
Pain	Hydrocodone	CYP2D6	Use label recommended age- or weight-specific dosing. If no response and opioid use is warranted, consider non-codeine or non-tramadol opioid.	OPTIONAL	CPIC	pathway
Pain	Ibuprofen	CYP2C9	Initiate therapy with recommended starting dose.	STRONG	CPIC	pathway
Pain	Lornoxicam	CYP2C9	Initiate therapy with recommended starting dose.	STRONG	CPIC	pathway
Pain	Meloxicam	CYP2C9	Initiate therapy with recommended starting dose.	STRONG	CPIC	pathway
Pain	Naproxen	CYP2C9	No recommendation due to minimal evidence regarding tolerability or efficacy.	N/A	CPIC	pathway
Pain	Oliceridine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Pain	Oxycodone	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	DPWG	pathway
Pain	Piroxicam	CYP2C9	Initiate therapy with recommended starting dose.	STRONG	CPIC	pathway
Pain	Tenoxicam	CYP2C9	Initiate therapy with recommended starting dose.	STRONG	CPIC	pathway
Pain	Tramadol	CYP2D6	Use label recommended age- or weight-specific dosing. If no response and	OPTIONAL	CPIC	pathway

Therapeutic Area	Medication Name	Genes	Recommendation	Strength of Recommendation	Source	Pathway
			opioid use is warranted, consider a non-codeine opioid			
Rheumatology	Pegloticase	G6PD	Use according to the product label	STRONG	CPIC	pathway
Urology	Darifenacin	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Urology	Fesoterodine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Urology	Mirabegron	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Urology	Tamsulosin	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway
Urology	Tolterodine	CYP2D6	No action required. Initiate therapy with recommended starting dose.	N/A	FDA	pathway

Regarding Phenotype Adjustment

There is currently no consensus on a method for adjusting inferred phenotypes when concomitant inhibitors or inducers are present.

Sequence2Script uses two strategies. The first strategy adjusts activity scores and only applies to CYP2C9 and CYP2D6. The activity score is multiplied by 0.50 if a moderate inhibitor is present, 0.00 if a strong inhibitor is present, and 1.50 if an inducer is present. The resulting activity score is than translated to the corresponding metabolizer phenotype using CPIC guidelines. The second strategy applies to CYP2B6, CYP2C19, CYP3A4, and CYP3A5. If a moderate inhibitor is present, the inferred phenotype is converted to the next lower activity phenotype (e.g., a normal metabolizer is converted to an intermediate metabolizer), whereas in the presence of a strong inhibitor the inferred phenotype is converted to a poor metabolizer, regardless of the inferred phenotype. In the presence of an inducer the inferred phenotype is converted to the next higher activity phenotype (e.g., an intermediate metabolizer is converted to a normal metabolizer). Sequence2Script does not perform adjustments for poor metabolizers in the presence of inhibitors or ultrarapid metabolizers in the presence of inducers because these phenotypes already represent the two extremes of the phenotype continuum. In cases where both a concomitant inhibitor and an inducer are present, the inferred phenotype in question is not adjusted as the evidence needed to guide the adjustment in these situations is limited. Finally, Sequence2Script does not perform adjustments for other factors such as age or inflammation that may alter inferred phenotypes. The aging process is accompanied by a decline in the function of numerous organs and systems that can affect pharmacokinetic processes to different extents, and this can make response to some drugs more variable. Inflammation (e.g., elevation in C reactive protein or proinflammatory cytokines) has been shown to have an inhibitory effect on several CYP450 enzymes (e.g., CYP3A4, CYP1A2, CYP2C9, CYP2C19, CYP2D6).

Regarding Sources of Recommendations

The recommendations made in this report are based on the recommendations provided by the Clinical Pharmacogenetics Implementation Consortium (CPIC, https://cpicpgx.org), the Dutch Pharmacogenetics Working Group (DPWG, https://www.pharmgkb.org/page/dpwg), and the US Food and Drug Administration (FDA) product labels. Therapeutic recommendations are based on weighing the evidence from a combination of preclinical, functional, and clinical data.

Regarding Strengths of Recommendations

The strength of a recommendation is based exclusively on pharmacogenetic information published in guidelines. They do not reflect the strength of a recommendation based on phenotypes that have been adjusted due to the presence of concomitant inhibitors or inducers. Strong: The evidence supporting the recommendation is high quality. The desirable effects clearly outweigh the undesirable effects. Moderate: There is a close or uncertain balance as to whether the evidence for this recommendation is high quality. The desirable effects clearly outweigh the undesirable effects. Optional: The desirable effects are closely balanced with undesirable effects, or the evidence is weak or based on extrapolations. There is room for differences in opinion as to the need for the recommended course of action. No recommendation: There is insufficient evidence, confidence, or agreement to provide a recommendation to guide clinical practice currently.

Alleles Tested

Gene	Alleles/Haplotypes
CYP2B6	*4, *5, *6, *7 ,*9 , *18, *22, *33, *34, *36
CYP2C9	*2, *3, *4, *5, *6, *8, *11, *14, *27, *35
CYP2C19	*2, *3, *4, *5, *6, *7, *8, *9, *10, *17
CYP2D6	*2, *3, *4, *5, *6, *7, *8,*9,*10, *11, *14, *17, *29, *34, *39, *41, *49, *64, *65, *69, *109, *114, copy number variation (Exon 9)
CYP3A4	*3, *22, *37
CYP3A5	*3, *6, *7
SLCO1B1	*5
VKORC1	*2
F2	rs1799963/20210G>A
F5	rs6025/1691G>A
G6PD	A, A- 202A_376G, Mediterranean, Dallas, Panama, Sassari, Cagliari, Birmingham, Chatham
ABCG2	rs2231142/421C>A
CYP4F2	*3, *4, *22
NUDT15	*2, *3
CYP2C Cluster	rs12777823

Genotyping was performed using Assay Developed and Validated within the TruLab Dx Network. This report was generated using Sequence2Script technology. Limitations: This test will not detect all known variants/alleles that result in altered gene activity. *1 or wild-type alleles are reported by default if those listed were not detected.

Only listed alleles are tested for and absence of a detected mutation does not rule out the possibility of sensitivity to a specific drug due to the presence of other mutations, clinical factors, drug-drug interactions, or environmental factors.

Report Inquiries

For additional clinical guidance guidance on interpreting this report, please contact TruLab Dx.

Disclaimer, Methods and Limitations

A multiplex Real-Time Polymerase Chain Reaction (RT-PCR) is carried out under optimized conditions to generate amplicons for the targeted alleles at analytical sensitivity and specificity >95%. This includes common variants with known clinical significance as well as copy number variation of CYP2D6 gene.

This assay was developed and characterized by a lab within TruLab Dx's Network. This assay has not been cleared or approved by the U.S. Food and Drug Administration (FDA). The FDA has determined that such approval is not necessary, provided that the laboratory maintains its good standing as a clinical testing laboratory with all mandatory accrediting agencies and continually demonstrates that its testing protocols and procedures achieve a high degree of analytical accuracy. Only a qualified healthcare professional should advise a person on the use of information in this report. All clinical decisions relative to the test results should be directed by your qualified healthcare provider. The laboratory makes no representations or recommendations regarding results.

This test does not detect all known variations that may result in altered or inactive gene function. The absence of a detectable gene variation or polymorphism does not rule out the possibility that a patient may exhibit intermediate or high-sensitivity phenotypes due to undetected polymorphisms or drug-drug interactions.

This report is intended for interpretation by licensed physicians, pharmacists, or other qualified healthcare professionals. It is designed as a clinical decision-support tool and is not a substitute for sound clinical judgment or appropriate medical oversight. Final therapeutic decisions must be made by the healthcare professional based on a comprehensive evaluation of the patient, prescribed medications, and all relevant clinical information.

TruLab Dx nor the labs within the TruLab Dx Network accept no responsibility for the modification or redistribution of this report and is not liable for any actions taken by individuals based on the information provided, nor for any inaccuracies, errors, or omissions in the content.

Do NO**T** stop or change your medications without consulting a qualified healthcare professional.