Pharmacogenomics (PGx) Report

Sample Information

Patient: John Doe

Date of Birth: Jan 1, 1980
Sex: Male

Physician: TruDiagnostic
Practice: TruDiagnostic
Sample ID: 1234567

Lab Information

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This report combines (i) an analysis of the patient's DNA by TruDiagnostic, Inc., identifying relevant genetic variants that are informative for medication efficacy, safety, and dosing, with (ii) an interpretation of the identified DNA variants by GeneMetrics to bring you immediately actionable clinical guidance regarding safer, more effective medica- tions and dosages for the patient. The Medication Report section lists the type of PGx guidance present on FDA-approved drug labels. Med- ications with no established FDA PGx guidance are provided solely for educational purposes.

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My Medications

Analyzed medication items include:

GeneAcuity does not identify risks concerning the medication list supplied for the following risk vectors: Pharmacogenetic risks, lifestyle factors, drug-to-drug interactions, anticholinergic burden, contraindications, FDA boxed warnings, AGS Beers criteria

Drug	Finding	Recommendation	Evidence

- Typical response is expected
- Consider alternative therapy
- Change recommended
- Additional information available
- Response is uncertain
- Strong
- Moderate
- Emerging

Medications Summary

Class	Standard Precautions	Caution/Info	High Risk / Change Recommended
Antidepressants	Fluvoxamine Bupropion Citalopram Escitalopram Desipramine and Imipramine (2C19) Paroxetine Venlafaxine Amitriptyline (2D6) Clomipramine (2D6) Desipramine (2D6) Imipramine (2D6) Doxepin (2D6) Trimipramine (2D6) Vortioxetine Nortriptyline Fluoxetine Protriptyline Amoxapine	Moclobemide Sertraline Doxepin (2C19) Trimipramine (2C19) Amitriptyline (2C19) Clomipramine (2C19)	
Antipsychotics	Perphenazine Haloperidol Risperidone Brexpiprazole Aripiprazole Zuclopenthixol Pimozide Iloperidone Clozapine (2D6) Aripiprazole Lauroxil Thioridazine Clozapine (1A2)	Quetiapine	
Antibiotics	Dapsone Nitrofurantoin		

Class	Standard Precautions	Caution/Info	High Risk / Change Recommended
Cardiovascular Agents	Carvedilol Nebivolol Propranolol Timolol Flecainide Propafenone Metoprolol		
Antithrombotics	Prasugrel Warfarin (2C9) Warfarin (4F2)	Warfarin (VKORC1) Phenprocoumon Acenocoumarol Ticagrelor	Clopidogrel
Analgesics	Oxycodone Tramadol Codeine Hydrocodone Oliceridine Celecoxib Flurbiprofen Ibuprofen Lornoxicam Piroxicam Tenoxicam Meloxicam		
ADHD	Amphetamines Dextroamphetamine Lisdexamfetamine Viloxazine	Atomoxetine	
Statins	Fluvastatin (2C9) Rosuvastatin (SLCO1B1) Simvastatin Pitavastatin Pravastatin Fluvastatin (SLCO1B1) Atorvastatin		

Class	Standard Precautions	Caution/Info	High Risk / Change Recommended
Antifungals		Voriconazole	
Anxiolytics	Diazepam	Clobazam	
Immunosuppressants	Sirolimus Thioguanine (NUDT15) Mercaptopurine (NUDT15) Azathioprine (NUDT15)	Thioguanine (TPMT) Azathioprine (TPMT) Mercaptopurine (TPMT)	
Anticonvulsants	Lacosamide Phenytoin Fosphenytoin	Clobazam Brivaracetam	
Proton Pump Inhibitors		Dexlansoprazole Lansoprazole Omeprazole Pantoprazole	
Antiemetics	Dronabinol Ondansetron Tropisetron Meclizine Metoclopramide		
Antineoplastics	Erdafitinib Tamoxifen Gefitinib	Belzutifan Cisplatin	
Central Nervous System Agents	Siponimod Tetrabenazine Dextromethorphan/Quinidine (Nuedexta) Valbenazine Deutetrabenazine		

Class	Standard Precautions	Caution/Info	High Risk / Change Recommended
Antidiabetics	Gliclazide Tolbutamide Glimepiride Glyburide/Glibenclamide Glipizide		
Genitourinary Agents	Tolterodine Fesoterodine Tamsulosin Mirabegron Darifenacin		
Additional Medications	Lofexidine Donepezil Galantamine Pegloticase Tafenoquine Primaquine Efavirenz Avatrombopag Lusutrombopag (F2) Eltrombopag Lusutrombopag (F5) Cevimeline Tacrolimus Pitolisant Eliglustat Estrogen-containing Oral Contraceptives Methylene Blue Dextromethorphan (2B6) Dextromethorphan (2D6) Flibanserin Toluidine Blue Rasburicase Elagolix	Abrocitinib Carisoprodol	Atazanavir

Medication Report Details (by therapeutic class)

Drug	Finding	Recommendation	Evidence
SSRI Antidepressants			
Citalopram (Celexa) *Based on CPIC Guidelines*	Citalopram (CYP2C19): Intermediate Metabolism	Reduced metabolism when compared to normal metabolizers. No adjustments needed from typical dosing strategies	
Escitalopram (Lexapro) *Based on CPIC Guidelines*	Escitalopram (CYP2C19): Intermediate Metabolism	Reduced metabolism when compared to normal metabolizers. No adjustments needed from typical dosing strategies	
Fluoxetine (Prozac) *FDA Drug label: Actionable PGx*	Fluoxetine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Fluvoxamine (Luvox) *Based on CPIC Guidelines*	Fluvoxamine (CYP2D6): Normal Metabolism	Typical; no action is required for this gene-drug interaction;	
Paroxetine (Paxil) *Based on CPIC Guidelines*	Paroxetine (CYP2D6): Normal Metabolism	Typical; no action is required for this gene-drug interaction	
Sertraline (Zoloft) *Based on CPIC Guidelines*	Sertraline (CYP2C19): Intermediate Metabolism	Reduced metabolism of sertraline to less active compounds when compared to normal metabolizers. Initiate therapy with recommended starting dose. Consider a slower titration schedule and lower maintenance dose than normal metabolizers.	
Drug	**Finding**	**Recommendation**	**Evidence**
TCA Antidepressants			
Amitriptyline (Elavil) *Based on CPIC Guidelines*	Amitriptyline (CYP2C19): Intermediate Metabolism	Reduced metabolism of tertiary amines compared to normal metabolizers. Initiate therapy with recommended starting dose.	
Amitriptyline (Elavil) *Based on CPIC Guidelines*	Amitriptyline (CYP2D6): Normal Metabolism	Normal metabolism of TCAs. Initiate therapy with recommended starting dose	

Drug	Finding	Recommendation	Evidence
TCA Antidepressants			
Amoxapine (Asendin) *FDA Drug label: Actionable PGx*	Amoxapine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Clomipramine (Anafranil) *Based on CPIC Guidelines*	Clomipramine (CYP2C19): Intermediate Metabolism	Reduced metabolism of tertiary amines compared to normal metabolizers. Initiate therapy with recommended starting dose.	
Clomipramine (Anafranil) *Based on CPIC Guidelines*	Clomipramine (CYP2D6): Normal Metabolism	Normal metabolism of TCAs. Initiate therapy with recommended starting dose	
Desipramine (Pertofrane) *Based on DPWG Guidelines*	Desipramine and Imipramine (CYP2C19): Intermediate Metabolism	NO action is required for this gene-drug interaction. The genetic variation increases imipramine plasma concentrations, but not imipramine+desipramine plasma concentrations, which govern effectiveness and side effects.	
Desipramine (Pertofrane) *Based on CPIC Guidelines*	Desipramine (CYP2D6): Normal Metabolism	Normal metabolism of TCAs. Initiate therapy with recommended starting dose	
Doxepin (Sinequan) *Based on CPIC Guidelines*	Doxepin (CYP2C19): Intermediate Metabolism	Reduced metabolism of tertiary amines compared to normal metabolizers. Initiate therapy with recommended starting dose.	
Doxepin (Sinequan) *Based on CPIC Guidelines*	Doxepin (CYP2D6): Normal Metabolism	Normal metabolism of TCAs. Initiate therapy with recommended starting dose	
Imipramine (Tofranil-PM) *Based on DPWG Guidelines*	Desipramine and Imipramine (CYP2C19): Intermediate Metabolism	NO action is required for this gene-drug interaction. The genetic variation increases imipramine plasma concentrations, but not imipramine+desipramine plasma concentrations, which govern effectiveness and side effects.	
Imipramine (Tofranil-PM) *Based on CPIC Guidelines*	Imipramine (CYP2D6): Normal Metabolism	Normal metabolism of TCAs. Initiate therapy with recommended starting dose	
Trimipramine (Surmontil) *Based on CPIC Guidelines*	Trimipramine (CYP2C19): Intermediate Metabolism	Reduced metabolism of tertiary amines compared to normal metabolizers. Initiate therapy with recommended starting dose.	

Drug	Finding	Recommendation	Evidence
TCA Antidepressants			
Trimipramine (Surmontil) *Based on CPIC Guidelines*	Trimipramine (CYP2D6): Normal Metabolism	Normal metabolism of TCAs. Initiate therapy with recommended starting dose	
Drug	**Finding**	**Recommendation**	**Evidence**
Other Antidepressants			
Bupropion (Wellbutrin) *FDA Drug label: Informative PGx*	Bupropion (CYP2B6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Moclobemide (Manerix) *SwissMedic Drug label: Actionable PGx*	Moclobemide (CYP2C19): Intermediate Metabolism	Moclobemide is partially metabolized by the polymorphic isozymes CYP450 2C19. Therefore, the metabolism of moclobemide may be affected in genetically induced or drug-induced slow metabolizers. Dose adjustment may be necessary according to SwissMedic.	
Venlafaxine (Effexor) *Based on DPWG Guidelines*	Venlafaxine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Vortioxetine (Trintellix) *FDA/EMA/HCSC Drug labels: Actionable PGx*	Vortioxetine (CYP2D6): Normal Metabolism	Typical; no action is required for this gene-drug interaction	
Drug	**Finding**	**Recommendation**	**Evidence**
1st Gen Antipsychotics			
Haloperidol (Haldol) *Based on DPWG Guidelines*	Haloperidol (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Perphenazine (Trilafon) *FDA/PMDA Drug labels: Actionable PGx*	Perphenazine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug		Finding	Recommendation	Evidence
1st Gen Antipsychotics				
Pimozide (Orap) *Based on DPWG Guidelines; FDA Drug label: Requires Testing*	✓	Pimozide (CYP2D6): Normal Metabolism	Typical; no action is required for this gene-drug interaction	
Thioridazine (Mellaril-S) *FDA Drug label: Actionable PGx*	✓	Thioridazine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Zuclopenthixol (Clopixol) *Based on DPWG Guidelines*	✓	Zuclopenthixol (CYP2D6): Normal Metabolism	Typical; no action is required for this gene-drug interaction;	
Drug		**Finding**	**Recommendation**	**Evidence**
2nd Gen Antipsychotics				
Aripiprazole (Abilify) *Based on DPWG Guidelines*	✓	Aripiprazole (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Aripiprazole Lauroxil (Aristada) *FDA Drug label: Actionable PGx*	✓	Aripiprazole Lauroxil (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Brexpiprazole (Rexulti) *Based on DPWG Guidelines*	✓	Brexpiprazole (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Clozapine (Clozaril) *Based on DPWG Guidelines*	?	Clozapine (CYP1A2): Indeterminate	Insufficient information to determine response	
Clozapine (Clozaril) *FDA Drug label: Actionable PGx*	✓	Clozapine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Iloperidone (Fanapt) *FDA Drug label: Actionable PGx*	✓	Iloperidone (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug	Finding	Recommendation	Evidence
2nd Gen Antipsychotics			
Quetiapine (Seroquel) *Based on DPWG Guidelines*	Quetiapine (CYP3A4): Intermediate metabolism	This gene variation reduces the conversion of quetiapine to inactive metabolites and a metabolite with antidepressant effect. However, the effect on the plasma concentration of quetiapine is limited (20% increase) and it is not known whether this has any clinical consequences. The relationship between the plasma concentration and clinical effect is weak for quetiapine. NO action is needed for this gene-drug interaction.	
Risperidone (Risperdal) *Based on DPWG Guidelines*	Risperidone (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Drug	**Finding**	**Recommendation**	**Evidence**
Antibiotics			
Dapsone (Aczone) *Based on CPIC Guidelines*	Dapsone (G6PD).: Normal (Class IV)	Low risk of acute hemolytic anemia. No reason to avoid high risk drugs based on G6PD status.	
Nitrofurantoin (Furadantin) *Based on CPIC Guidelines*	Nitrofurantoin (G6PD).: Normal (Class IV)	Low risk of acute hemolytic anemia No reason to avoid medium risk drugs based on G6PD status	
Drug	**Finding**	**Recommendation**	**Evidence**
Antihypertensives			
Carvedilol (Coreg) *FDA/HCSC Actionable PGx*	Carvedilol (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Metoprolol (Lopressor) *DPWG*	Metoprolol (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Nebivolol (Bystolic) *FDA/SwissMedic Informative PGx*	Nebivolol (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug		Finding	Recommendation	Evidence
Antihypertensives				
Propranolol (Inderal) *FDA/EMA Informative PGx*	✓	Propranolol (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Timolol (Betimol) *EMA Informative PGx*	✓	Timolol (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Drug		**Finding**	**Recommendation**	**Evidence**
Antiarrhythmics				
Flecainide (Tambocor) *DPWG*	✓	Flecainide (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Propafenone (Rythmol) *DPWG*	✓	Propafenone (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Drug		**Finding**	**Recommendation**	**Evidence**
Antithrombotics				
Acenocoumarol (Acenomac) *DPWG*	i	Acenocoumarol Response (VKORC1): Reduced Function	The genetic variation results in a reduction of the required dose, but with the current practice of initiating or reviewing treatment this results in little or no increased risk of bleeding or excessive anticoagulation. NO action is needed for this gene-drug interaction	
Clopidogrel (Plavix) *CPIC*	–	Clopidogrel - Cardiovascular Indications (CYP2C19): Intermediate Metabolism	Reduced clopidogrel active metabolite formation; increased on-treatment platelet reactivity; increased risk for adverse cardiac and cerebrovascular events Avoid standard dose (75 mg) clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication	

Drug		Finding	Recommendation	Evidence
Antithrombotics				
Clopidogrel (Plavix) *CPIC*	–	Clopidogrel - Neurovascular Indications (CYP2C19): Intermediate Metabolism	Reduced clopidogrel active metabolite formation; increased on-treatment platelet reactivity; increased risk for adverse cardiac and cerebrovascular events Consider an alternative P2Y12 inhibitor at standard dose if clinically indicated and no contraindication. Alternative P2Y12 inhibitors not impacted by CYP2C19 genetic variants include ticagrelor and ticlopidine. Prasugrel is contraindicated in patients with a history of stroke or TIA	■■
Phenprocoumon (Liquamar) *DPWG*	i	Phenprocoumon Response (VKORC1): Reduced Function	The gene variation leads to a lower dose requirement, but regular monitoring of patients ensures that this does not lead to a distinct increase in the risk of bleeding. NO action is needed for this gene-drug interaction	■
Prasugrel (Effient) *FDA/EMA/SwissMedic Informative PGx*	✓	Prasugrel (CYP2C19): Intermediate Metabolism	There is no relevant effect from variation of CYP2C19 and Prasugrel. No adjustments needed from typical dosing strategies	
Ticagrelor (Brilinta) *EMA Actionable PGx*	i	Ticagrelor (CYP2C19): Intermediate Metabolism	In patients with intermediate CYP2C19 metabolism, non-coronary artery by-pass grafting (non-CABG) PLATO major bleeding was increased when treated with ticagrelor compared to clopidogrel. Currently no recommendations from the EMA	
Warfarin sodium (Coumadin) *CPIC*	✓	Warfarin (CYP4F2): *1/*1	Typical; no adjustment needed from typical dosing strategies	■
Warfarin sodium (Coumadin) *DPWG*	?	Warfarin (CYP2C9): Indeterminate	Insufficient information to determine response	
Warfarin sodium (Coumadin) *DPWG*	i	Warfarin Dosing (VKORC1): Reduced Function	The genetic variation results in a reduction in the required dose and an increase in the risk of excessively severe inhibition of blood clotting during the first month of the treatment. However, the effect is small and GA is also the most common genotype, meaning that the standard treatment will primarily be based on patients with this genotype. NO action is needed for this gene-drug interaction	■

Drug		Finding	Recommendation	Evidence
Analgesics				
Codeine *CPIC; Swissmedic requires testing*	✓	Codeine (CYP2D6): Normal Metabolism	Expected morphine formation Use codeine label recommended age- or weight-specific dosing	
Hydrocodone *CPIC*	✓	Hydrocodone (CYP2D6): Normal Metabolism	Normal hydromorphone formation Use hydrocodone label recommended age- or weight-specific dosing	
Oliceridine (Olinvyk) *FDA Actionable PGx*	✓	Oliceridine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Oxycodone (Oxycontin) *SwissMedic Actionable PGx*	✓	Oxycodone (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Tramadol (Ultracet, Ultram) *CPIC*	✓	Tramadol (CYP2D6): Normal Metabolism	Expected O-desmethyltramadol (active metabolite) formation Use tramadol label recommended age- or weight-specific dosing	
Drug		**Finding**	**Recommendation**	**Evidence**
NSAIDs				
Celecoxib (Celebrex) *CPIC*	?	Celecoxib (CYP2C9): Indeterminate	Insufficient information to determine response	
Flurbiprofen (Ansaid) *CPIC*	?	Flurbiprofen (CYP2C9): Indeterminate	Insufficient information to determine response	
Ibuprofen (Motrin) *CPIC*	?	Ibuprofen (CYP2C9): Indeterminate	Insufficient information to determine response	
Lornoxicam (Xefo) *CPIC*	?	Lornoxicam (CYP2C9): Indeterminate	Insufficient information to determine response	
Meloxicam (Mobic) *CPIC*	?	Meloxicam (CYP2C9): Indeterminate	Insufficient information to determine response	
Piroxicam (Feldene) *CPIC*	?	Piroxicam (CYP2C9): Indeterminate	Insufficient information to determine response	

Drug	Finding	Recommendation	Evidence
NSAIDs			
Tenoxicam (Mobiflex) *CPIC*	Tenoxicam (CYP2C9): Indeterminate	Insufficient information to determine response	

Drug	Finding	Recommendation	Evidence
ADHD Stimulants			
Amphetamine (Adzenys ER) *FDA Informative PGx*	Amphetamine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Dextroamphetamine (Dexedrine) *FDA Informative PGx*	Dextroamphetamine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Lisdexamfetamine (Vyvanse) *FDA Informative PGx*	Lisdexamfetamine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug	Finding	Recommendation	Evidence
ADHD non-stimulants			
Atomoxetine (Strattera) *CPIC*	Atomoxetine (CYP2D6): Normal Metabolism	Normal metabolizers of atomoxetine have a lower likelihood of response as compared to poor metabolizers. This is associated with increased discontinuation due to lack of efficacy as compared to poor metabolizers. Initiate with a dose of 0.5 mg/kg and increase to 1.2 mg/kg/day after 3 days. If no clinical response and in the absence of adverse events after 2 weeks, consider obtaining a peak plasma concentration (1 to 2 hours after dose administered). If <200 ng/ml, consider a proportional increase in dose to approach 400 ng/ml	
Viloxazine (Qelbree) *FDA Actionable PGx*	Viloxazine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug		Finding	Recommendation	Evidence
Statins				
Atorvastatin (Lipitor) *CPIC*	✓	Atorvastatin Uptake (SLCO1B1): Normal Function	Typical myopathy risk and statin exposure Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	
Atorvastatin (Lipitor) *SwissMedic Actionable PGx*	✓	Atorvastatin Uptake (SLCO1B1 T521C): Typical	Typical; no adjustments needed from typical dosing strategies	
Fluvastatin (Lescol) *CPIC*	?	Fluvastatin (CYP2C9): Indeterminate	Insufficient information to determine response	
Fluvastatin (Lescol) *CPIC*	✓	Fluvastatin Uptake (SLCO1B1): Normal Function	Typical myopathy risk and statin exposure Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	
Pitavastatin (Livalo) *CPIC/SwissMedic*	✓	Pitavastatin Uptake (SLCO1B1): Normal Function	Typical myopathy risk and statin exposure Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	
Pravastatin (Pravachol) *CPIC*	✓	Pravastatin Uptake (SLCO1B1): Normal Function	Typical myopathy risk and statin exposure Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	
Rosuvastatin (Crestor) *CPIC*	✓	Rosuvastatin Uptake (SLCO1B1): Normal Function	Typical myopathy risk and statin exposure Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	
Simvastatin (Zocor) *CPIC/DPWG*	✓	Simvastatin Uptake (SLCO1B1): Normal Function	Typical myopathy risk and statin exposure Prescribe desired starting dose and adjust doses based on disease-specific guidelines.	
Drug		**Finding**	**Recommendation**	**Evidence**
Antifungals				
Voriconazole (Vfend) *CPIC*	i	Voriconazole (CYP2C19): Intermediate Metabolism	Higher dose-adjusted trough concentrations of voriconazole compared to normal metabolizers. Initiate therapy with recommended standard of care dosing	

Drug	Finding	Recommendation	Evidence
Anxiolytics			
Clobazam (Onfi) *FDA Actionable PGx*	Clobazam (CYP2C19): Intermediate Metabolism	Results in higher systemic active metabolite concentrations. Intermediate metabolism results in potential for higher adverse reaction risk. Dosage adjustment is recommended. Refer to FDA labeling for specific dosing recommendations.	
Diazepam (Valium) *FDA Actionable PGx*	Diazepam (CYP2C19): Intermediate Metabolism	Currently no recommendation from the FDA. No adjustments needed from typical dosing strategies	
Drug	**Finding**	**Recommendation**	**Evidence**
Immunosuppressants			
Azathioprine (Imuran) *CPIC; FDA - Testing Recommended*	Azathioprine (TPMT): Intermediate Metabolism	Moderate to high concentrations of TGN metabolites; low concentrations of meTIMP. Increased risk of thiopurine-related leukopenia, neutropenia, myelosuppression. Start with reduced starting doses (30-80% of normal dose) if normal starting dose is 2-3 mg/kg/day, (e.g. 0.6-2.4 mg/kg/day), and adjust doses of azathioprine based on degree of myelosuppression and disease-specific guidelines. Allow 2-4 weeks to reach steady-state after each dose adjustment.	
Azathioprine (Imuran) *CPIC; FDA - Testing Recommended*	Azathioprine (NUDT15): Normal Metabolism	Normal risk of thiopurine-related leukopenia, neutropenia, myelosuppression Start with normal starting dose (e.g., 2-3 mg/kg/day) and adjust doses of azathioprine based on disease-specific guidelines. Allow 2 weeks to reach steady state after each dose adjustment.	

Drug	Finding	Recommendation	Evidence
Immunosuppressants			
Mercaptopurine (Purinethol) *CPIC; FDA - Testing Recommended*	Mercaptopurine (TPMT): Intermediate Metabolism	Moderate to high concentrations of TGN metabolites; low concentrations of meTIMP. Increased risk of thiopurine-related leukopenia, neutropenia, myelosuppression. Start with reduced starting doses (30-80% of normal dose) if normal starting dose is > or = 75 mg/m2/day or > or = 1.5 mg/kg/day (e.g. start at 25-60 mg/m2/day or 0.45-1.2 mg/kg/day) and adjust doses of mercaptopurine based on degree of myelosuppression and disease-specific guidelines. Allow 2-4 weeks to reach steady-state after each dose adjustment. If myelosuppression occurs, and depending on other therapy, emphasis should be on reducing mercaptopurine over other agents. If normal starting dose is already < 75 mg/m2/day or < 1.5 mg/kg/day, dose reduction may not be recommended	
Mercaptopurine (Purinethol) *CPIC; FDA - Testing Recommended*	Mercaptopurine (NUDT15): Normal Metabolism	Normal risk of thiopurine-related leukopenia, neutropenia, myelosuppression Start with normal starting dose (e.g., 75 mg/m2/day or 1.5 mg/kg/day) and adjust doses of mercaptopurine (and of any other myelosuppressive therapy) without any special emphasis on mercaptopurine compared to other agents. Allow at least 2 weeks to reach steady-state after each dose adjustment.	
Sirolimus (Rapamune) *EMA Informative PGx*	Sirolimus (CYP3A4): Intermediate metabolism	Currently no recommendations from the EMA. No adjustments needed from typical dosing strategies	
Thioguanine (Tabloid, Lanvis) *CPIC; FDA - Testing Recommended*	Thioguanine (TPMT): Intermediate Metabolism	Moderate to high concentrations of TGN metabolites; but note that TGN after thioguanine are 5-10X higher than TGN after mercaptopurine or azathioprine. Increased risk of thiopurine-related leukopenia, neutropenia, myelosuppression. Start with reduced doses (50% to 80% of normal dose) if normal starting dose is > or = 40-60 mg/m2/day (e.g. 20-48 mg/m2/day) and adjust doses of thioguanine based on degree of myelosuppression and disease-specific guidelines. Allow 2-4 weeks to reach steady-state after each dose adjustment. If myelosuppression occurs, and depending on other therapy, emphasis should be on reducing thioguanine over other agents.	

Drug	Finding	Recommendation	Evidence
Immunosuppressants			
Thioguanine (Tabloid, Lanvis) *CPIC; FDA - Testing Recommended*	Thioguanine (NUDT15): Normal Metabolism	Normal risk of thiopurine-related leukopenia, neutropenia, myelosuppression Start with normal starting dose (40-60 mg/day). Adjust doses of thioguanine and of other myelosuppressive therapy without any special emphasis on thioguanine. Allow 2 weeks to reach steady-state after each dose adjustment.	
Drug	**Finding**	**Recommendation**	**Evidence**
Anticonvulsants			
Brivaracetam (Briviact) *FDA Actionable PGx*	Brivaracetam (CYP2C19): Intermediate Metabolism	Results in higher systemic concentrations and higher adverse reaction risk. Consider dosage reductions in poor metabolizers.	
Clobazam (Onfi) *FDA Actionable PGx*	Clobazam (CYP2C19): Intermediate Metabolism	Results in higher systemic active metabolite concentrations. Intermediate metabolism results in potential for higher adverse reaction risk. Dosage adjustment is recommended. Refer to FDA labeling for specific dosing recommendations.	
Fosphenytoin (Cerebyx) *(CPIC)*	Fosphenytoin (CYP2C9): Indeterminate	Insufficient information to determine response	
Lacosamide (Vimpat) *EMA/FDA Informative PGx*	Lacosamide (CYP2C19): Intermediate Metabolism	Currently no recommendation from the FDA. No adjustments needed from typical dosing strategies	
Phenytoin (Dilantin) *(DPWG)*	Phenytoin (CYP2C9): Indeterminate	Insufficient information to determine response	
Drug	**Finding**	**Recommendation**	**Evidence**
Proton Pump Inhibitors			

Drug	Finding	Recommendation	Evidence
Proton Pump Inhibitors			
Dexlansoprazole (Dexilant) *CPIC*	Dexlansoprazole (CYP2C19): Intermediate Metabolism	Increased plasma concentration of Dexlansoprazole compared to CYP2C19 NMs; increased chance of efficacy and potentially toxicity Initiate standard starting daily dose. For chronic therapy (>12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.	
Lansoprazole (Prevacid) *CPIC*	Lansoprazole (CYP2C19): Intermediate Metabolism	Increased plasma concentration of Lansoprazole compared to CYP2C19 NMs; increased chance of efficacy and potentially toxicity Initiate standard starting daily dose. For chronic therapy (>12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.	
Omeprazole (Prilosec) *CPIC*	Omeprazole (CYP2C19): Intermediate Metabolism	Increased plasma concentration of Omeprazole compared to CYP2C19 NMs; increased chance of efficacy and potentially toxicity Initiate standard starting daily dose. For chronic therapy (>12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.	
Pantoprazole (Protonix) *CPIC*	Pantoprazole (CYP2C19): Intermediate Metabolism	Increased plasma concentration of Pantoprazole compared to CYP2C19 NMs; increased chance of efficacy and potentially toxicity Initiate standard starting daily dose. For chronic therapy (>12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.	

Drug	Finding	Recommendation	Evidence
Antiemetics			
Dronabinol (Marinol) *FDA Actionable PGx*	Dronabinol (CYP2C9): Indeterminate	Insufficient information to determine response	
Meclizine (Antivert) *FDA Actionable PGx*	Meclizine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug		Finding	Recommendation	Evidence
Antiemetics				
Metoclopramide (Reglan) *FDA Actionable PGx*	✓	Metoclopramide (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Ondansetron (Zofran) *CPIC*	✓	Ondansetron (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Tropisetron (Navoban) *CPIC*	✓	Tropisetron (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Drug		**Finding**	**Recommendation**	**Evidence**
Antineoplastics				
Belzutifan (Welireg) *FDA Actionable PGx*	i	Belzutifan (CYP2C19): Intermediate Metabolism	May result in higher systemic concentrations. No adjustments needed from typical dosing strategies	+
Cisplatin (Platinol) *CPNDS (Pediatric-specific)*	!	Cisplatin (TPMT): Intermediate Metabolism	High risk of developing cisplatin-induced ototoxicity; increase monitoring in high risk patients, and consider the use of otoprotectants (i.e. amifostine, sodium thiosulfate) if the patient's tumor type is one for which otoprotectants may be effective to prevent cisplatin-induced ototoxicity without adversely affecting antitumor activity Alternative treatments may be prescribed when they have demonstrated equal efficacy, manageable and acceptable toxicity, less ototoxicity, and are considered options within the current standards of care. Where appropriate, physicians are encouraged to increase monitoring in high-risk patients.	+
Erdafitinib (Balversa) *FDA Actionable PGx*	?	Erdafitinib (CYP2C9): Indeterminate	Insufficient information to determine response	
Gefitinib (Iressa) *FDA/EMA/SwissMedic Actionable PGx*	✓	Gefitinib (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug	Finding	Recommendation	Evidence
Antineoplastics			
Tamoxifen (Nolvadex) *CPIC; HCSC requires testing*	Tamoxifen (CYP2D6): Normal Metabolism	Therapeutic endoxifen concentrations Avoid moderate and strong CYP2D6 inhibitors. Initiate therapy with recommended standard of care dosing (tamoxifen 20 mg/day).	

Drug	Finding	Recommendation	Evidence
Central Nervous System Agents			
Deutetrabenazine (Austedo) *FDA Actionable PGx*	Deutetrabenazine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Dextromethorphan Hydrobromide; Quinidine Sulfate (Nuedexta) *FDA recommends testing*	Dextromethorphan/Quinidine (Nuedexta) (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Siponimod (Mayzent) *DPWG; FDA/EMA/HCSC require testing*	Siponimod (CYP2C9): Indeterminate	Insufficient information to determine response	
Tetrabenazine (Xenazine) *FDA/Swissmedic require testing*	Tetrabenazine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Valbenazine (Ingrezza) *FDA Actionable PGx*	Valbenazine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug	Finding	Recommendation	Evidence
Antidiabetics			
Gliclazide (Diamicron) *SwissMedic Actionable PGx*	Gliclazide (G6PD).: Normal (Class IV)	Currently no recommendation from the EMA. No adjustments needed from typical dosing strategies	

Drug		Finding	Recommendation	Evidence
Antidiabetics				
Glimepiride (Amaryl) *FDA/EMA/HCSC/Swiss Medic Actionable PGx*	✓	Glimepiride (G6PD).: Normal (Class IV)	Currently no recommendation from the FDA/EMA. No adjustments needed from typical dosing strategies	
Glipizide (Glucotrol) *FDA Actionable PGx*	✓	Glipizide (G6PD).: Normal (Class IV)	Currently no recommendation from the FDA. No adjustments needed from typical dosing strategies	
Glyburide (Micronase) *EMA/FDA/HSCS/Swiss Medic Actionable PGx*	✓	Glyburide/Glibenclamide (G6PD).: Normal (Class IV)	Currently no recommendation from the FDA/EMA. No adjustments needed from typical dosing strategies	
Tolbutamide (Orinase) *FDA/HCSC Actionable PGx*	✓	Tolbutamide (G6PD).: Normal (Class IV)	Currently no recommendation from the FDA/EMA. No adjustments needed from typical dosing strategies	
Drug		**Finding**	**Recommendation**	**Evidence**
Genitourinary Agents				
Darifenacin (Enablex) *EMA/FDA/HCSC/Swiss Medic Actionable PGx*	✓	Darifenacin (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Fesoterodine (Toviaz) *FDA Actionable PGx*	✓	Fesoterodine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Mirabegron (Myrbetriq) *FDA Actionable PGx*	✓	Mirabegron (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Tamsulosin (Flomax) *FDA Actionable PGx*	✓	Tamsulosin (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Tolterodine (Detrol) *FDA Actionable PGx*	✓	Tolterodine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug	Finding	Recommendation	Evidence
Additional Medications			
Abrocitinib (Cibinqo) *FDA Actionable PGx*	Abrocitinib (CYP2C19): Intermediate Metabolism	May result in higher systemic concentrations. No adjustments needed from typical dosing strategies	
Atazanavir (Reyataz) *CPIC*	Atazanavir (UGT1A1): Poor Metabolism	Markedly decreased UGT1A1 activity; high likelihood of bilirubin-related discontinuation of atazanavir. Consider an alternative agent, particularly where jaundice would be of concern to the patient.	
Avatrombopag (Doptelet) *EMA/FDA Actionable PGx*	Avatrombopag (CYP2C9): Indeterminate	Insufficient information to determine response	
Carisoprodol (Soma) *FDA Actionable PGx*	Carisoprodol (CYP2C19): Intermediate Metabolism	May result in higher systemic concentrations. Currently no recommendation from the FDA. No adjustments needed from typical dosing strategies	
Cevimeline (Evoxac) *FDA Actionable PGx*	Cevimeline (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Dextromethorphan (Delsym) *FDA Informative PGx*	Dextromethorphan (CYP2B6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Dextromethorphan (Delsym) *SwissMedic Actionable PGx*	Dextromethorphan (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Donepezil (Aricept) *FDA Actionable PGx*	Donepezil (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Efavirenz (Sustiva) *CPIC; FDA/EMA/HCSC/Swiss Medic Actionable PGx*	Efavirenz (CYB2B6): Normal Metabolism	Normal efavirenz metabolism Initiate efavirenz with standard dosing (600 mg/day)	
Elagolix (Orilissa) *FDA Actionable PGx*	Elagolix Uptake (SLCO1B1 T521C): Typical	Typical; no adjustments needed from typical dosing strategies	

Drug		Finding	Recommendation	Evidence
Additional Medications				
Eliglustat (Cerdelga) *DPWG; FDA/EMA/PMDA require testing*	✓	Eliglustat (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Eltrombopag (Promacta) *FDA/EMA/HCSC Actionable PGx*	✓	Eltrombopag Metabolism (F5): Typical	Currently no recommendation from international institutions. No adjustments needed from typical dosing strategies	
Estrogen-containing Oral Contraceptives *DPWG*	✓	Estrogen-containing Oral contraceptives safety (F5): Typical	NO action is needed for this gene-drug interaction	
Flibanserin (Addyi) *FDA Actionable PGx*	✓	Flibanserin (CYP2C19): Intermediate Metabolism	Currently no recommendation from the FDA. No adjustments needed from typical dosing strategies	
Galantamine (Razadyne) *FDA Informative PGx*	✓	Galantamine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Lofexidine (Lucemyra) *FDA Actionable PGx*	✓	Lofexidine (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	
Lusutrombopag (Mulpleta) *FDA Actionable PGx*	✓	Lusutrombopag (F2): Typical	Currently no recommendation from the FDA. No adjustments needed from typical dosing strategies	
Lusutrombopag (Mulpleta) *FDA Actionable PGx*	✓	Lusutrombopag (F5): Typical	Currently no recommendation from the FDA. No adjustments needed from typical dosing strategies	
Methylene Blue (Provayblue) *CPIC*	✓	Methylene Blue (G6PD).: Normal (Class IV)	Low risk of acute hemolytic anemia. No reason to avoid high risk drugs based on G6PD status.	
Pegloticase (Krystexxa) *CPIC*	✓	Pegloticase (G6PD).: Normal (Class IV)	Low risk of acute hemolytic anemia. No reason to avoid high risk drugs based on G6PD status.	
Pitolisant (Wakix) *EMA/FDA/HCSC Actionable PGx*	✓	Pitolisant (CYP2D6): Normal Metabolism	Normal Metabolism. No adjustments needed from typical dosing strategies	

Drug	Finding	Recommendation	Evidence
Additional Medications			
Primaquine *CPIC*	Primaquine (G6PD).: Normal (Class IV)	Low risk of acute hemolytic anemia No reason to avoid primaquine based on G6PD status	
Rasburicase (Elitek) *CPIC*	Rasburicase (G6PD).: Normal (Class IV)	Low risk of acute hemolytic anemia. No reason to avoid high risk drugs based on G6PD status.	
Tacrolimus (Prograf) *CPIC/DPWG*	Tacrolimus (CYP3A5): Poor Metabolism	Higher (“normal”) dose-adjusted trough concentrations of tacrolimus and increased chance of achieving target tacrolimus concentrations CPIC recommends initiating therapy with standard recommended dose. Use therapeutic drug monitoring to guide dose adjustments	
Tafenoquine (Arakoda) *CPIC*	Tafenoquine (G6PD).: Normal (Class IV)	Low risk of acute hemolytic anemia. No reason to avoid high risk drugs based on G6PD status.	
Toluidine Blue (Toluidine Blue) *CPIC*	Toluidine Blue (G6PD).: Normal (Class IV)	Low risk of acute hemolytic anemia. No reason to avoid high risk drugs based on G6PD status.	

Typical response is expected
Consider alternative therapy
Change recommended
Additional information available
Response is uncertain
Strong
Moderate
Emerging

PGx Info Card

This card contains an abbreviated genetic summary.
It is not intended as a replacement for the complete GeneAcuity™ report.

TruDiagnostic
https://trudiagnostic.app.genemetrics.com

Patient: John Doe
DOB: 1980-01-01
Sample ID: 1234567

This card shows information about your genetics that relate to drug metabolism. Show to your doctors before being prescribed new medications.

Pharmacogenomic Summary

12q15	CC	Normal Function
4q25	WT/WT	Typical Function
ADH1B T143C	TT	Normal Function
ALDH2 G1510A	GG	Normal Function
ANKK1 G2137A	GG	Normal Function
APOe	ε3/ε3	Normal Function
BDNF C196T	CT	Heterozygous Variant
C11orf65	AC	Heterozygous Variant
CACNA1C G5361A	GG	Normal Function
CACNA1C G270344A	AG	Heterozygous Variant
COMT G472A	AA	Homozygous variant
CYP2B6	*1/*1	Normal Metabolism
CYP2C19	*1/*8	Intermediate Metabolism
CYP2C9	Indeterminate	Uncertain Allele
CYP2D6	*1/*68+*4;*10/*68+*4	Normal Metabolism
CYP3A4	*1/*22	Normal Metabolism
CYP3A5	*3/*3	Poor Metabolism
CYP4F2	*1/*1	Normal Metabolism
F13A1 C103A	CC	Normal Function
F2 G*97A	GG	Normal Function
F5 C1601T	CC	Normal Function
G6PD	B/B	Normal (Class IV)
GRIK1 C1251+1338A	AA	Homozygous variant
GRIK4 T83-10039C	TT	Normal Function
GRIN2B T412-46269A	AT	Heterozygous Variant
HLA-A*31:01	AA	WT
HLA-B*57:01	TT	WT
IL6/IL6-AS1 (G>C)	GG	Normal Function
ITGB3 T176C	TT	Normal Function
KIF6 A2155G	AG	Heterozygous Variant
LP(a)	AA/TT	Normal Function
MTHFR	AA/TT	25% enzyme activity
NUDT15	*1/*1	Normal Metabolism
OPRD1 C227+6066T	CT	Heterozygous variant
OPRK1 T258-5311C	TT	Typical Function
OPRM1 A118G	AA	Normal Function
SLCO1B1		Normal Function
SLCO1B1 T521C	TT	Normal Function
TNF G-308A	GG	Wildtype
TPMT	*1/*3A or *3B/*3C	Intermediate Metabolism
UGT1A1	*80/*80	Poor Metabolism
VKORC1 C-1639T	CT	Reduced Function

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