Other Drugs

Therapeutic Class	Standard Precautions	Caution / Info	Change recommended
Alpha-1 Blockers		Tamsulosin	
Anticholinergic Agents		Fesoterodine	
Antidiabetics		Gliclazide Glimepiride Glyburide Metformin Saxagliptin Tolbutamide	
Beta-3 Adrenergic Agonists			
Cholinergic Agonists		Cevimeline	
Contraceptives			
EGFR Inhibitors		Gefitinib	
Immunosuppressants		Sirolimus	
Vesicular monoamine transporter 2 inhibitor		Deutetrabenazine Valbenazine	

Legend

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

Clinical Evidence Level

- Strong
- Moderate
- Emerging

Medication Report Details (by therapeutic class)

Drug	Finding	Recommendation	Concern	Evidence
Alpha-1 Blockers				
Tamsulosin (Flomax) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Analgesics, Opioid				
Methadone (CYP2B6) *FDA drug label: Not established for PGx*	CYP2B6: Uncertain Allele	No recommendation for Methadone (CYP2B6) is available for this combination of variants/alleles.		

Drug	Finding	Recommendation	Concern	Evidence
Anti-ADHD Agents				
Amphetamine (Adzenys, Evekeo) *FDA drug label: Not established for PGx*	COMT(Val158Met): Normal function. Two normal function alleles.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		
Atomoxetine (Strattera) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Clonidine (Clonidine, Kapvay) *FDA drug label: Not established for PGx*	ADRA2A(C-1291G): Not Tested	No recommendation for Clonidine is available due to absent laboratory assay results.		
Dexmethylphenidate (Focalin) *FDA drug label: Not established for PGx*	COMT(Val158Met): Normal function. Two normal function alleles.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		
Dextroamphetamine (Zenzedi, Dexedrine) *FDA drug label: Not established for PGx*	COMT(Val158Met): Normal function. Two normal function alleles.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		
Guanfacine (Tenex, Intuniv) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	
Lisdexamfetamine (Vyvanse) *FDA drug label: Not established for PGx*	COMT(Val158Met): Normal function. Two normal function alleles.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		
Methylphenidate (COMT) (Concerta, Metadate, Ritalin, Ritalin LA, Quillivant, Daytrana, Methylin) *FDA drug label: Not established for PGx*	COMT(Val158Met): Normal function. Two normal function alleles.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Antiarrhythmics				
Flecainide (Tambocor) *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Propafenone (Rythmol) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Anticholinergic Agents				
Fesoterodine (Toviaz) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Tolterodine (Detrol) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Anticoagulants				
Acenocoumarol (Sintrom, Acitrom) *FDA drug label: Not established for PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Warfarin (Coumadin) *FDA drug label: Actionable PGx*	Multigenic VKORC1: Uncertain Allele CYP2C9: *1|*12	No recommendation for Warfarin is available for this combination of variants/alleles.		
Warfarin (CYP4F2) (Coumadin) *FDA drug label: Actionable PGx*	Multigenic CYP2C9: *1|*12 VKORC1: Uncertain Allele CYP4F2: *1|*1	No recommendation for Warfarin (CYP4F2) is available for this combination of variants/alleles.		
Anticonvulsants				
Brivaracetam *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	
Carbamazepine (HLA-A*3101) (Tegretol) *FDA drug label: Actionable PGx*	HLA-A*3101: Negative; Absence of *31:01 alleles.	Individuals with wild type alleles are expected to show typical response. No additional therapeutic recommendations.		
Clobazam (Onfi) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Phenytoin (Dilantin) *FDA drug label: Actionable PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Antidementia Agents				
Donepezil (Aricept)  *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Antidepressants				
Amitriptyline (CYP2C19, CYP2D6) (Elavil) *FDA drug label: Not established for PGx*	Multigenic CYP2D6: *1/*4 CYP2C19: *1|*2	Individuals with this combination of alleles frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Amoxapine (Asendin) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Bupropion (Wellbutrin) *FDA drug label: Not established for PGx*	ANKK1: Altered function. Two altered function alleles.	Individuals with altered function of this gene frequently present with increased risk of pharmacotherapy failure. Be alert to lack of efficacy; consider alternative medication.	Efficacy	
Clomipramine (CYP2C19, CYP2D6) (Anafranil, Clomicalm) *FDA drug label: Not established for PGx*	Multigenic CYP2D6: *1/*4 CYP2C19: *1|*2	Individuals with this combination of alleles frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Desipramine (Norpramin) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Doxepin (CYP2C19, CYP2D6) (Quitaxon, Aponal, Sinequan) *FDA drug label: Actionable PGx*	Multigenic CYP2D6: *1/*4 CYP2C19: *1|*2	Individuals with this combination of alleles frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Duloxetine (Cymbalta) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Imipramine (CYP2C19, CYP2D6) (Tofranil-PM, Tofranil) *FDA drug label: Actionable PGx*	Multigenic CYP2D6: *1/*4 CYP2C19: *1|*2	Individuals with this combination of alleles frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Mirtazapine *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Typical response expected. No additional therapeutic recommendations.		
Moclobemide (Manerix, Aurorix, Amira, Clobemix, Depnil) *FDA drug label: Not established for PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Nortriptyline (Pamelor) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Protriptyline (Vivactil) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Trazodone (Oleptro, Desyrel) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Trimipramine (Surmontil) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Trimipramine (CYP2C19, CYP2D6) (Surmontil) *FDA drug label: Not established for PGx*	Multigenic CYP2D6: *1/*4 CYP2C19: *1|*2	Individuals with this combination of alleles frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Venlafaxine (Effexor) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with lower plasma concentrations of the active medication/medication ratio, thus an increased risk of side effects and/or pharmacotherapy failure. This medication should be avoided.	ADR & Efficacy	
Vortioxetine (Brintellix) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Antidiabetics				
Gliclazide *FDA drug label: Not established for PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, frequently present with increased medication efficacy. No additional therapeutic recommendations.	Efficacy	
Glimepiride *FDA drug label: Not established for PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, frequently present with increased medication efficacy. No additional therapeutic recommendations.	Efficacy	
Glyburide (Glibenclamide) *FDA drug label: Not established for PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Metformin (Glucophage®) *FDA drug label: Not established for PGx*	ATM: One wild type allele and one variant allele.	Increased drug efficacy likely.		
Saxagliptin (Onglyza) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Tolbutamide (Orinase) *FDA drug label: Not established for PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Antiemetics				
Ondansetron (Zofran) *FDA drug label: Informative PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication. Monitor the patient's response to guide dosing.	ADR	
Tropisetron (Navoban, Setrovel) *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Antifungals				
Ketoconazole (Nizoral) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus a significantly increased risk of side effects. This medication should be avoided.	ADR	
Voriconazole (Vfend) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with notably lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Monitor the patient's response to guide dosing, or consider using an alternative medication.	Efficacy	
Antineoplastic				
Cisplatin (Platinol) *FDA drug label: Not established for PGx*	TPMT: *1|*1	Normal metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Antineoplastic Agents				
Methotrexate (Rheumatrex, Trexall) *FDA drug label: Not established for PGx*	MTHFR: Uncertain Allele	No recommendation for Methotrexate is available for this combination of variants/alleles.		

Drug	Finding	Recommendation	Concern	Evidence
Antiplatelet Agents				
Clopidogrel *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication frequently present with lower plasma concentrations of the active medication, thus a significantly increased risk of pharmacotherapy failure. This medication should be avoided.	Efficacy	
Prasugrel *FDA drug label: Informative PGx*	CYP2C19: *1|*2	Typical response expected. No additional therapeutic recommendations.		
Ticagrelor (Brilinta) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Antipsychotics				
Aripiprazole (Abilify) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Brexpiprazole (Rexulti) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Clozapine *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Flupenthixol *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Typical response expected. No additional therapeutic recommendations.		
Haloperidol (Haldol) *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Iloperidone *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	
Olanzapine (Zalasta, Zyprexa) *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Typical response expected. No additional therapeutic recommendations.		
Perphenazine (Trilafon) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Pimozide (Orap) *FDA drug label: Testing required*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Quetiapine (Seroquel) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Risperidone (Risperdal) *FDA drug label: Informative PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Thioridazine *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus a significantly increased risk of side effects. This medication should be avoided.	ADR	
Zuclopenthixol *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Anti-Retroviral Agents				
Efavirenz *FDA drug label: Actionable PGx*	CYP2B6: Uncertain Allele	No recommendation for Efavirenz is available for this combination of variants/alleles.		
Nevirapine *FDA drug label: Not established for PGx*	CYP2B6: Uncertain Allele	No recommendation for Nevirapine is available for this combination of variants/alleles.		

Drug	Finding	Recommendation	Concern	Evidence
Antivirals				
Abacavir *FDA drug label: Testing required*	HLA-B*5701: Negative; Absence of *57:01 alleles.	Individuals with wild type alleles are expected to show typical response. No additional therapeutic recommendations.		
Anxiolytics				
Alprazolam (Xanax, Niravam) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Buspirone (Buspar) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with notably higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Clonazepam (Klonopin) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Diazepam *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Beta-3 Adrenergic Agonists				
Mirabegron (Myrbetriq) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication. No additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Beta Blockers				
Carvedilol (Coreg) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions.	ADR	
Metoprolol (Lopressor) *FDA drug label: Informative PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Nebivolol (Bystolic) *FDA drug label: Informative PGx*	CYP2D6: *1/*4	Typical response expected. No additional therapeutic recommendations.		
Propranolol (Inderal) *FDA drug label: Informative PGx*	CYP2D6: *1/*4	Typical response expected. No additional therapeutic recommendations.		
Timolol (Blocadren) *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Central Monoamine-Depleting Agents				
Tetrabenazine (Xenazine) *FDA drug label: Testing required*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Central Nervous System Agents				
Dextromethorphan-Quinidine (Nuedexta) *FDA drug label: Testing recommended*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions, or consider alternative medication.	ADR	
Cholinergic Agonists				
Cevimeline (Evoxac) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Cholinesterase Inhibitors				
Galantamine (Razadyne, Razadyne ER, Nivalin, Lycoremine, Reminyl) *FDA drug label: Informative PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Contraceptives				
Estrogen-containing oral contraceptives *FDA drug label: Not established for PGx*	F5: Two wild-type alleles.	Individuals with wild type alleles are expected to show typical response. No additional therapeutic recommendations.		
EGFR Inhibitors				
Gefitinib (Iressa) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Endocrine-Metabolic Agents				
Eliglustat *FDA drug label: Testing required*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Estrogen Agonists/Antagonists				
Tamoxifen (Soltamox, Nolvadex) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with lower plasma concentrations of the active medication, thus a significantly increased risk of pharmacotherapy failure. This medication should be avoided.	Efficacy	
Hypnotics				
Eszopiclone (Lunesta) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with notably higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Immunosuppressants				
Azathioprine (Imuran) *FDA drug label: Testing recommended*	TPMT: *1|*1	Normal metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Azathioprine (NUDT15) (Imuran)	NUDT15: *1|*1	Normal metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Cyclosporine (Gengraf, Neoral) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Mercaptopurine (Purinethol) *FDA drug label: Testing recommended*	TPMT: *1|*1	Normal metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Mercaptopurine (NUDT15) (Purinethol) *FDA drug label: Testing recommended*	NUDT15: *1|*1	Normal metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Sirolimus (Rapamune) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Tacrolimus (Prograf, Hecoria) *FDA drug label: Not established for PGx*	CYP3A5: *3|*3	Poor metabolizers of this medication frequently present with higher plasma concentrations of the active medication, frequently present with increased medication efficacy. No additional therapeutic recommendations.	Efficacy	
Thioguanine (6-TG, Tabloid, Lanvis) *FDA drug label: Testing recommended*	TPMT: *1|*1	Normal metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Thioguanine (NUDT15) (6-TG, Tabloid, Lanvis) *FDA drug label: Testing recommended*	NUDT15: *1|*1	Normal metabolizers of this medication are expected to show typical response. No additional therapeutic recommendations.		
Muscle Relaxants				
Carisoprodol (Soma) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions, or consider alternative medication.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Non-drug				
12q15	12q15: Not Tested	No recommendation for 12q15 is available due to absent laboratory assay results.		
4q25	4q25: Not Tested	No recommendation for 4q25 is available due to absent laboratory assay results.		
ADH1B	ADH1B: Not Tested	No recommendation for ADH1B is available due to absent laboratory assay results.		
ALDH2	ALDH2: Not Tested	No recommendation for ALDH2 is available due to absent laboratory assay results.		
ANKK1	ANKK1: Altered function. Two altered function alleles.	Altered function. Two alleles with altered activity.		
ApoE	ApoE: Not Tested	No recommendation for ApoE is available due to absent laboratory assay results.		
BDNF	BDNF: C|C	Normal function. Two alleles with normal activity.		
CACNA1C(270344G>A)	CACNA1C(270344G>A): A/A	Uncertain phenotype		
CACNA1C(5361G>A)	CACNA1C(5361G>A): A/A	Uncertain phenotype		
COMT(Val158Met)	COMT(Val158Met): Normal function. Two normal function alleles.	Typical response is expected; no additional therapeutic recommendations.		
CYP1A2	CYP1A2: Not Tested	No recommendation for CYP1A2 is available due to absent laboratory assay results.		
CYP2B6	CYP2B6: Uncertain Allele	No recommendation for CYP2B6 is available for this combination of variants/alleles.		
CYP4F2	CYP4F2: *1|*1	No recommendation for CYP4F2 is available for this combination of variants/alleles.		

Drug	Finding	Recommendation	Concern	Evidence
F13A1	F13A1: Not Tested	No recommendation for F13A1 is available due to absent laboratory assay results.		
FKBP5	FKBP5: Altered function. Two altered function alleles.	No recommendation for FKBP5 is available for this combination of variants/alleles.		
FKBP5(rs1360780)	FKBP5(rs1360780): C/C	Uncertain phenotype		
FKBP5(rs1902023)	FKBP5(rs4713916): G/G	Uncertain phenotype		
G6PD	G6PD: Uncertain Allele	No recommendation for G6PD is available for this combination of variants/alleles.		
GRIK1(rs2832407)	GRIK1(rs2832407): A/A	Uncertain phenotype		
GRIK4	GRIK4: One wild type allele and one variant allele.	No additional therapeutic recommendations.		
GRIN2B	GRIN2B: Indeterminate function. One normal function allele and one altered function allele.	No recommendation for GRIN2B is available for this combination of variants/alleles.		
HTR2A	HTR2A: Uncertain Allele	No recommendation for HTR2A is available for this combination of variants/alleles.		
HTR2C(-759C>T)	HTR2C(-759C>T): C/C	Uncertain phenotype		
HTR2C(2565G>C)	HTR2C(2565G>C): C/C	Uncertain phenotype		
IFNL3	IFNL3: Indeterminate function. One normal function allele and one altered function allele.	No recommendation for IFNL3 is available for this combination of variants/alleles.		
IL6	IL6: Not Tested	No recommendation for IL6 is available due to absent laboratory assay results.		
ITGB3	ITGB3: Not Tested	No recommendation for ITGB3 is available due to absent laboratory assay results.		

Drug	Finding	Recommendation	Concern	Evidence
MTHFR (A1298C)	MTHFR (A1298C): Uncertain Allele	No recommendation for MTHFR (A1298C) is available for this combination of variants/alleles.		
MTHFR (C677T)	MTHFR (C677T): Not Tested	No recommendation for MTHFR (C677T) is available due to absent laboratory assay results.		
NUDT15	NUDT15: *1|*1	Typical response is expected; no additional therapeutic recommendations.		
OPRD1(rs678849)	OPRD1(rs678849): C/T	Uncertain phenotype		
OPRK1(rs6473797)	OPRK1(rs6473797): T/T	Uncertain phenotype		
OPRM1(A118G)	OPRM1(A118G): Normal function. Two alleles with normal activity.	Normal function. Two alleles with normal activity.		

Drug	Finding	Recommendation	Concern	Evidence
Nonsteroidal Anti-Inflamatory Drugs (NSAIDs)				
Celecoxib (Celebrex) *FDA drug label: Actionable PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with notably higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Diclofenac (Cataflam) *FDA drug label: Not established for PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Flurbiprofen (Ocufen) *FDA drug label: Actionable PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Ibuprofen (Motrin, Advil) *FDA drug label: Not established for PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Lornoxicam (Xefo) *FDA drug label: Not established for PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Meloxicam (Mobic) *FDA drug label: Actionable PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with notably higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Piroxicam (Feldene) *FDA drug label: Actionable PGx*	CYP2C9: *1|*12	Intermediate metabolizers of this medication may present with notably higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Opioids				
Alfentanil (Rapifen, Alfenta) *FDA drug label: Not established for PGx*	OPRM1(A118G): Normal function. Two alleles with normal activity.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		
Buprenorphine (Butrans, Buprenex) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with notably higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Codeine *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with notably lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Be alert to lack of efficacy.	Efficacy	
Fentanyl (Duragesic, Sublimaze) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Be alert to adverse reactions; monitor the patient's response to guide dosing.	ADR	
Fentanyl (OPRM1) (Duragesic, Sublimaze) *FDA drug label: Not established for PGx*	OPRM1(A118G): Normal function. Two alleles with normal activity.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		
Hydrocodone *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Be alert to lack of efficacy; monitor the patient's response to guide dosing.	Efficacy	
Hydromorphone (Dilaudid) *FDA drug label: Not established for PGx*	OPRM1(A118G): Normal function. Two alleles with normal activity.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Morphine (MS-IR) *FDA drug label: Not established for PGx*	OPRM1(A118G): Normal function. Two alleles with normal activity.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		
Oxycodone (Oxycontin) *FDA drug label: Not established for PGx*	CYP2D6: *1/*4	Typical response expected. No additional therapeutic recommendations.		
Oxycodone (CYP3A4) (Oxycontin) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Be alert to lack of efficacy; monitor the patient's response to guide dosing.	Efficacy	
Oxycodone (CYP3A5) (Oxycontin) *FDA drug label: Not established for PGx*	CYP3A5: *3|*3	Poor metabolizers of this medication may present with notably lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Be alert to lack of efficacy; monitor the patient's response to guide dosing.	Efficacy	
Sufentanil (Sufenta) *FDA drug label: Not established for PGx*	OPRM1(A118G): Normal function. Two alleles with normal activity.	Individuals with normal function of this gene are expected to show typical response. No additional therapeutic recommendations.		
Tramadol (Ultracet, Ultram) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication frequently present with lower plasma concentrations of the active medication, thus a significantly increased risk of pharmacotherapy failure. Be alert to lack of efficacy; monitor the patient's response to guide dosing.	Efficacy	
Prokinetic agents				
Metoclopramide (Primperan, Reglan) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Proton Pump Inhibitors (PPIs)				
Dexlansoprazole (Dexilant, Kapidex) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Esomeprazole (Nexium) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Lansoprazole (Prevacid) *FDA drug label: Informative PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Omeprazole (Prilosec, Zegerid) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Pantoprazole (Protonix) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication frequently present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Rabeprazole (Aciphex) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Selective Serotonin Reuptake Inhibitors (SSRIs)				
Citalopram (Celexa) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Monitor the patient's response to guide dosing.	ADR	
Escitalopram (Lexapro) *FDA drug label: Actionable PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Monitor the patient's response to guide dosing.	ADR	
Fluoxetine (Prozac) *FDA drug label: Informative PGx*	CYP2D6: *1/*4	Typical response expected. No additional therapeutic recommendations.		
Fluvoxamine (Luvox) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	
Paroxetine (Paxil) *FDA drug label: Informative PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	
Sertraline (Zoloft) *FDA drug label: Not established for PGx*	CYP2C19: *1|*2	Intermediate metabolizers of this medication frequently present with notably higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose; monitor the patient's response to guide dosing.	ADR	

Drug	Finding	Recommendation	Concern	Evidence
Statins				
Atorvastatin (Lipitor, Caduet) *FDA drug label: Not established for PGx*	CYP3A4: *22|*22	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose, or using an alternative medication.	ADR	
Simvastatin (Zocor) *FDA drug label: Informative PGx*	SLCO1B1: Normal function. Two normal function alleles.	Individuals with normal SLCO1B1 liver uptake activity are expected to have a typical response to a standard dose of simvastatin.		
Vesicular monoamine transporter 2 inhibitor				
Deutetrabenazine (Austedo) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with notably higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	
Valbenazine (Ingrezza) *FDA drug label: Actionable PGx*	CYP2D6: *1/*4	Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication, thus an increased risk of side effects. Consider reducing the dose.	ADR	

Clinical Evidence Levels

Strong

- Includes gene-drug pairs approved by the Coriell Institute for Medical Research Pharmacogenomics Advisory Group.
- Includes gene-drug pairs supported by multiple studies documenting consistent effects of specific genetic variant(s) on clinical outcomes.
- Includes gene-drug pairs approved by the Dutch Pharmacogenetics Working Group (DPWG) and/or guidelines published in Clinical Pharmacology and Therapeutics by the Clinical Pharmacogenetics Implementation Consortium (CPIC).

Moderate

- Includes gene-drug pairs supported by pharmacokinetic, pharmacodynamic, or molecular/cellular functional studies showing consistent effects of genetic variant(s).
- Includes Drug product information (e.g. This interpretation is based on guidance available in the FDA (Food and Drug Administration) drug label for ABILIFY® (10/2013).
- Includes gene-drug pairs for which potential clinical outcomes are inferred from similar gene-drug interactions approved by the Dutch Pharmacogenetics Working Group (DPWG), and/or guidelines published in Clinical Pharmacology and Therapeutics by the Clinical Pharmacogenetics Implementation Consortium (CPIC), and/or pharmacogenomic reports and submission from the Coriell Institute for Medical Research.

Emerging

- Includes gene-drug pairs supported by published studies of the drug, related drug, or a probing compound of interest involving limited data and/or inconsistent findings.

Patient Information Card

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

TruDiagnostic, Inc.
https://trudiagnostic.com/

Patient: John Smith, John
DOB: 1991-01-06
Sample ID: TD0009

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

Pharmacogenomic Summary

12q15	Not Tested	n/a
4q25	Not Tested	n/a
ADH1B	Not Tested	n/a
ADRA2A(C-1291G)	Not Tested	n/a
ALDH2	Not Tested	n/a
ANKK1	A|A	Altered function
ApoE	Not Tested	See full GeneDose report
ATM	A|C	Increased likelihood of treatment success when taking metformin
BDNF	C|C	Normal function
CACNA1C(270344G>A)	A/A	Unknown Metabolizer
CACNA1C(5361G>A)	A/A	Unknown Metabolizer
COMT(Val158Met)	G|G	Normal function
CYP1A2	Not Tested	n/a
CYP2B6	Uncertain Allele	n/a
CYP2C19	*1|*2	Intermediate metabolizer
CYP2C9	*1|*12	Intermediate metabolizer
CYP2D6	*1/*4	Intermediate metabolizer
CYP3A4	*22|*22	Intermediate metabolizer
CYP3A5	*3|*3	Poor metabolizer
CYP4F2	*1|*1	Normal (with respect to Warfarin)
F13A1	Not Tested	n/a
FKBP5	CG|CG	n/a
FKBP5(rs1360780)	C/C	Unknown Metabolizer
FKBP5(rs4713916)	G/G	Unknown Metabolizer
G6PD	Uncertain Allele	n/a
GRIK1(rs2832407)	A/A	Unknown Metabolizer
GRIK4	T|C	Positive
GRIN2B	T|A	n/a
HLA-A*3101	WT|WT	Negative
HLA-B*5701	WT|WT	Negative
HTR2A	Uncertain Allele	n/a
HTR2C(2565G>C)	C/C	Unknown Metabolizer
HTR2C(-759C>T)	C/C	Unknown Metabolizer
IFNL3	C|T	n/a
IL6	Not Tested	n/a
ITGB3	Not Tested	n/a
MTHFR	Uncertain Allele	See full GeneDose report
MTHFR (A1298C)	Uncertain Allele	See full GeneDose report
MTHFR (C677T)	Not Tested	See full GeneDose report
NUDT15	*1|*1	Normal metabolizer
OPRD1(rs678849)	C/T	Unknown Metabolizer
OPRK1(rs6473797)	T/T	Unknown Metabolizer
OPRM1(A118G)	A|A	Normal function
SLCO1B1	*1|*1	Normal liver uptake activity
TPMT	*1|*1	Normal metabolizer
VKORC1	Uncertain Allele	n/a

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