PATIENT INFORMATION		SPECIMEN DETAILS		PROVIDER INFORMATION
NAME:	**SUMMER**	**SPECIMEN TYPE:**	4N6FLOQ SWABS	
ACC #:	M23001760	**COLLECTION DATE:**	6/27/2023	
DOB:	3/30	**RECEIVED DATE:**	6/28/2023	
SEX:	Female	**REPORT DATE:**	7/12/2023	

Clinical Health Panel

Risk Management

⚠ Antipsychotic-Induced Tardive Dyskinesia
Increased Risk of Antipsychotic-Induced Tardive Dyskinesia

The patient does not carry the Taq1A variant (homozygous for the A2 allele).

The genotype results predict that the patient has normal dopamine receptor DRD2 density and functioning. The patient has increased risk for tardive dyskinesia when treated with antipsychotics.

Closely monitor the patient for signs of tardive dyskinesia.

✓ Antipsychotic-Induced Hyperprolactinemia
Normal Risk of Antipsychotic-Induced Hyperprolactinemia

The patient does not carry the Taq1A variant (homozygous for the A2 allele).

The genotype results predict that the patient has normal dopamine receptor DRD2 density and functioning. The patient has normal risk of hyperprolactinemia when treated with antipsychotics.

Monitor the patients closely for any signs of hyperprolactinemia.

✓ Antipsychotic-Induced Weight Gain
Low Risk of Antipsychotic-Induced Weight Gain

The patient does not carry the Taq1A variant (homozygous for the A2 allele).

The genotype results predict that the patient has normal dopamine receptor DRD2 density and functioning. The patient has a normal risk for weight gain when treated with antipsychotics.

Monitor the patient closely for signs of weight gain.

✓ Type III Hyperlipoproteinemia
Not Associated with Type III Hyperlipoproteinemia

The patient is negative for both the APOE c.388 T>C (Cys130Arg) and c.526 C>T (Arg176Cys) mutations. The patient's genotype is wild-type, which is the most common genotype in the general population (frequency: >60%).

A patient with wild-type genotype does not have a defect in the apolipoprotein E (APOE), which is an integral structure of lipoprotein particles that have critical roles in blood lipid metabolism and transport. The APOE ε3/ε3 genotype is not associated with increased risk of cardiovascular disease.

No action is needed when a patient is normolipidemic.

✓ Hyperhomocysteinemia - Depression
No Increased Risk of Hyperhomocysteinemia

The patient carries one copy of the MTHFR c.665C>T variant (heterozygous). MTHFR enzyme activity is reduced (60% of normal activity).

Patients diagnosed with depression often have low folate levels and homocysteine is a highly sensitive marker of folate status. Functional folate deficiency is indicated by elevated homocysteine. The patient's small reduction in MTHFR activity is not a risk factor for hyperhomocysteinemia.

Patients diagnosed with depression: as lower folate levels are associated with poorer antidepressant response, and baseline levels of folate within the normal range predict antidepressant response, testing for homocysteine levels and serum folate levels may be informative for this patient before prescribing methylfolate as an antidepressant-augmenting agent.

✓ Thrombophilia
Normal Risk of Thrombosis

The patient does not carry the F5 c.1601G>A variant (also known as Factor V Leiden) or the F2 c.*97G>A variant (also known as Factor II 20210G>A).

The patient's risk of thrombosis is not increased (average risk of clotting is about 1 in 1000 for anyone in a year). However, because this test cannot find all of the inherited reasons for abnormal clotting, other factors may affect this risk assessment.

Assess thrombotic risk based on other genetic and/or circumstantial risk factors such as smoking, obesity, malignancy, prolonged immobilization or surgery.

Estrogen-containing contraceptive and hormone replacement therapy: unless other genetic and/or circumstantial risk factors are present, consider standard prescribing and monitoring practices.

Hyperhomocysteinemia - Thrombosis

No Increased Risk of Hyperhomocysteinemia

The patient carries one copy of the MTHFR c.665C>T variant and one copy of the c.1286A>C variant (compound heterozygous). MTHFR enzyme activity is reduced.

Based on results for the MTHFR c.665C>T and c.1286A>C variants, the patient has reduced MTHFR activity, which is not a risk factor for hyperhomocysteinemia. Hyperhomocysteinemia is associated with a risk for venous thromboembolism (VTE). Unless other risk factors are present, the patient is not expected to have an increased risk for VTE.

Testing total plasma homocysteine level may be beneficial. Hyperhomocysteinemia can be treated with nutritional supplementation.

A medication has potentially reduced efficacy, increased toxicity or the patient has an increased risk for the indicated condition.	**ACTIONABLE**	Recommendations based upon publications by international pharmacogenetic expert groups, consortia or regulatory bodies (CPIC, DPWG, FDA, EMA). Recommendations are suitable for implementation in a clinical setting. Guidelines may change as knowledge arises.
Guidelines exist for adjusting dosage, increased vigilance or the patient has a moderate risk for the indicated condition.		
The medication can be prescribed according to standard regimens or the patient's risk for the indicated condition is not increased.	**INFORMATIVE**	There are insufficient or contradictory findings documenting the impact of a given genetic polymorphism or drug interaction. Recommendations are informative and implementation in a clinical setting is optional.

Potentially Impacted Medications

CATEGORY	DRUG CLASS	STANDARD PRECAUTIONS	USE WITH CAUTION	CONSIDER ALTERNATIVES
Anticancer Agents	Antifolates		Methotrexate (Trexall®)	
	Thiopurines	Azathioprine (Azasan®, Imuran®) Mercaptopurine (Purinethol®, Purixan®) Thioguanine (Tabloid®)		
Cardiovascular	Angiotensin II Receptor Antagonists	Azilsartan (Edarbi®, Edarbyclor®) Candesartan (Atacand®) Eprosartan (Teveten®) Irbesartan (Avapro®) Losartan (Cozaar®, Hyzaar®) Olmesartan (Benicar®) Telmisartan (Micardis®) Valsartan (Diovan®, Entresto®)		
	Antianginal Agents	Ranolazine (Ranexa®)		
	Antiarrhythmics	Amiodarone (Nexterone®, Pacerone®) Disopyramide (Norpace®) Quinidine (Quinidine®) Sotalol (Betapace®, Sorine®, Sotylize®)	Flecainide (Tambocor®) Mexiletine (Mexitil®) Propafenone (Rythmol®)	
	Anticoagulants	Apixaban (Eliquis®) Betrixaban (Bevyxxa®) Dabigatran Etexilate (Pradaxa®) Edoxaban (Savaysa®) Fondaparinux (Arixtra®) Rivaroxaban (Xarelto®) Warfarin (Coumadin®)		
	Antiplatelets	Clopidogrel (Plavix®) Prasugrel (Effient®) Ticagrelor (Brilinta®) Vorapaxar (Zontivity®)		
	Beta Blockers	Atenolol (Tenormin®) Bisoprolol (Zebeta®) Carvedilol (Coreg®) Labetalol (Normodyne®, Trandate®) Nebivolol (Bystolic®) Propranolol (Inderal®)	Metoprolol (Lopressor®) Timolol (Blocadren®)	
	Cardiac myosin inhibitor	Mavacamten (Camzyos®)		
	Diuretics	Torsemide (Demadex®)		
	Statins		Fluvastatin (Lescol®) Pravastatin (Pravachol®) Rosuvastatin (Crestor®)	Atorvastatin (Lipitor®) Lovastatin (Mevacor®, Altoprev®, Advicor®) Pitavastatin (Livalo®) Simvastatin (Zocor®)

CATEGORY	DRUG CLASS	STANDARD PRECAUTIONS	USE WITH CAUTION	CONSIDER ALTERNATIVES
Diabetes	Meglitinides	Nateglinide (Starlix®) Repaglinide (Prandin®, Prandimet®)		
	Sulfonylureas	Chlorpropamide (Diabinese®) Glimepiride (Amaryl®) Glipizide (Glucotrol®) Glyburide (Micronase®) Tolbutamide (Orinase®)		
Gastrointestinal	Antiemetics	Aprepitant (Emend-oral®) Dolasetron (Anzemet®) Dronabinol (Marinol®) Fosaprepitant (Emend-IV®) Fosnetupitant / Palonosetron (Akynzeo-IV®) Granisetron (Sancuso®, Sustol®) Netupitant / Palonosetron (Akynzeo-oral®) Ondansetron (Zofran®, Zuplenz®) Palonosetron (Aloxi®) Rolapitant (Varubi®)	Metoclopramide (Reglan®)	
	Proton Pump Inhibitors	Esomeprazole (Nexium®) Rabeprazole (Aciphex®)	Dexlansoprazole (Dexilant®, Kapidex®) Lansoprazole (Prevacid®) Omeprazole (Prilosec®) Pantoprazole (Protonix®)	
Gaucher Disease	Endocrine-Metabolic Agents	Eliglustat (Cerdelga®) Imiglucerase (Cerezyme®) Miglustat (Zavesca®) Taliglucerase alfa (Elelyso®) Velaglucerase alfa (Vpriv®)		
Hematology	Hemostatic Agents	Avatrombopag (Doptelet®) Eltrombopag (Promacta®) Lusutrombopag (Mulpleta®)		
Infections	Antifungals	Amphotericin B (AmBisome®, Abelcet®) Anidulafungin (Eraxis®) Caspofungin (Cancidas®) Fluconazole (Diflucan®) Isavuconazonium (Cresemba®) Itraconazole (Sporanox®) Micafungin (Mycamine®) Posaconazole (Noxafil®) Voriconazole (Vfend®)		
	Anti-HIV Agents	Dolutegravir (Tivicay®, Triumeq®) Doravirine (Pifeltro®) Etravirine (Edurant®) Raltegravir (Isentress®, Dutrebis®) Rilpivirine (Intelence®)	Efavirenz (Sustiva®)	
	Antimalarials	Proguanil (Malarone®)		
	Fibromyalgia Agents	Milnacipran (Savella®)		

CATEGORY	DRUG CLASS	STANDARD PRECAUTIONS	USE WITH CAUTION	CONSIDER ALTERNATIVES
Pain	Muscle Relaxants	Carisoprodol (Soma®) Cyclobenzaprine (Flexeril®, Amrix®) Metaxalone (Skelaxin®) Methocarbamol (Robaxin®)	Tizanidine (Zanaflex®)	
	NSAIDs	Celecoxib (Celebrex®) Diclofenac (Voltaren®) Flurbiprofen (Ansaid®) Ibuprofen (Advil®, Motrin®) Indomethacin (Indocin®) Ketoprofen (Orudis®) Ketorolac (Toradol®) Meloxicam (Mobic®) Nabumetone (Relafen®) Naproxen (Aleve®) Piroxicam (Feldene®) Sulindac (Clinoril®)		
	Opioids	Alfentanil (Alfenta®) Buprenorphine (Butrans®, Buprenex®) Dihydrocodeine (Synalgos-DC®) Hydromorphone (Dilaudid®, Exalgo®) Levorphanol (Levo Dromoran®) Meperidine (Demerol®) Morphine (MS Contin®) Oliceridine (Olinvyk) Oxycodone (Percocet®, Oxycontin®) Oxymorphone (Opana®, Numorphan®) Sufentanil (Sufenta®) Tapentadol (Nucynta®)	Benzhydrocodone (Apadaz®) Codeine (Codeine; Fioricet® with Codeine) Fentanyl (Actiq®) Hydrocodone (Vicodin®) Methadone (Dolophine®) Tramadol (Ultram®)	
	Antiaddictives	Lofexidine (Lucemyra®) Naltrexone (Vivitrol®, Contrave®)	Bupropion (Wellbutrin®, Zyban®, Aplenzin®, Contrave®)	
	Anti-ADHD Agents	Amphetamine (Adderall®, Evekeo®) Clonidine (Kapvay®) Dextroamphetamine (Dexedrine®) Guanfacine (Intuniv®) Lisdexamfetamine (Vyvanse®)	Atomoxetine (Strattera®) Dexmethylphenidate (Focalin®) Methylphenidate (Ritalin®, Aptensio XR®, Concerta®, Metadate ER®, Quillivant ER®)	

CATEGORY	DRUG CLASS	STANDARD PRECAUTIONS	USE WITH CAUTION	CONSIDER ALTERNATIVES
Psychotropic	**Anticonvulsants**	Brivaracetam (Briviact®) Cannabidiol (Epidiolex®) Carbamazepine (Tegretol®, Carbatrol®, Epitol®) Eslicarbazepine (Aptiom®) Ethosuximide (Zarontin®) Ezogabine (Potiga®) Felbamate (Felbatol®) Fosphenytoin (Cerebyx®) Gabapentin (Neurontin®) Lacosamide (Vimpat®) Lamotrigine (Lamictal®) Levetiracetam (Keppra®) Oxcarbazepine (Trileptal®, Oxtellar XR®) Perampanel (Fycompa®) Phenobarbital (Luminal®) Phenytoin (Dilantin®) Pregabalin (Lyrica®) Primidone (Mysoline®) Rufinamide (Banzel®) Tiagabine (Gabitril®) Topiramate (Topamax®) Valproic Acid (Depakene®) Vigabatrin (Sabril®) Zonisamide (Zonegran®)		
	Antidementia Agents	Donepezil (Aricept®) Galantamine (Razadyne®) Memantine (Namenda®)		
	Antidepressants	Citalopram (Celexa®) Desvenlafaxine (Pristiq®) Duloxetine (Cymbalta®) Escitalopram (Lexapro®) Fluoxetine (Prozac®, Sarafem®) Levomilnacipran (Fetzima®) Mirtazapine (Remeron®) Nefazodone (Serzone®) Trazodone (Oleptro®) Venlafaxine (Effexor®) Vilazodone (Viibryd®)	Amitriptyline (Elavil®) Amoxapine (Amoxapine®) Clomipramine (Anafranil®) Desipramine (Norpramin®) Doxepin (Silenor®) Fluvoxamine (Luvox®) Imipramine (Tofranil®) Maprotiline (Ludiomil®) Nortriptyline (Pamelor®) Paroxetine (Paxil®, Brisdelle®) Protriptyline (Vivactil®) Sertraline (Zoloft®) Trimipramine (Surmontil®) Vortioxetine (Trintellix®)	

CATEGORY	DRUG CLASS	STANDARD PRECAUTIONS	USE WITH CAUTION	CONSIDER ALTERNATIVES
Rheumatology	Antipsychotics	Aripiprazole (Abilify®, Aristada®) Asenapine (Saphris®) Brexpiprazole (Rexulti®) Cariprazine (Vraylar®) Chlorpromazine (Thorazine®) Fluphenazine (Prolixin®) Haloperidol (Haldol®) Loxapine (Loxitane®, Adasuve®) Lurasidone (Latuda®) Paliperidone (Invega®) Pimavanserin (Nuplazid®) Pimozide (Orap®) Quetiapine (Seroquel®) Risperidone (Risperdal®) Thiothixene (Navane®) Trifluoperazine (Stelazine®) Ziprasidone (Geodon®)	Clozapine (Clozaril®) Iloperidone (Fanapt®) Olanzapine (Zyprexa®) Perphenazine (Trilafon®)	Thioridazine (Mellaril®)
	Benzodiazepines	Alprazolam (Xanax®) Clobazam (Onfi®) Clonazepam (Klonopin®) Diazepam (Valium®)	Lorazepam (Ativan®) Oxazepam (Serax®)	
	Other Neurological Agents	Deutetrabenazine (Austedo®) Dextromethorphan / Quinidine (Nuedexta®) Flibanserin (Addyi®) Valbenazine (Ingrezza®)	Tetrabenazine (Xenazine®)	
	Anti-Hyperuricemics and Anti-Gout Agents	Colchicine (Mitigare®) Febuxostat (Uloric®)		
	Immunomodulators	Apremilast (Otezla®) Leflunomide (Arava®) Tofacitinib (Xeljanz®)		
Sjogren's Syndrome	Cholinergic Agonists	Cevimeline (Evoxac®)		
Transplantation	Immunosuppressants	Tacrolimus (Prograf®)		
Urologicals	5-Alpha Reductase Inhibitors for Benign Prostatic Hyperplasia	Dutasteride (Avodart®) Finasteride (Proscar®)		
	Alpha-Blockers for Benign Prostatic Hyperplasia	Alfuzosin (UroXatral®) Doxazosin (Cardura®) Silodosin (Rapaflo®) Tamsulosin (Flomax®) Terazosin (Hytrin®)		
	Antispasmodics for Overactive Bladder	Darifenacin (Enablex®) Fesoterodine (Toviaz®) Mirabegron (Myrbetriq®) Oxybutynin (Ditropan®) Solifenacin (Vesicare®) Tolterodine (Detrol®) Trospium (Sanctura®)		

CATEGORY	DRUG CLASS	STANDARD PRECAUTIONS	USE WITH CAUTION	CONSIDER ALTERNATIVES
	Phosphodiesterase Inhibitors for Erectile Dysfunction	Avanafil (Stendra®) Sildenafil (Viagra®) Tadalafil (Cialis®) Vardenafil (Levitra®)		

Dosing Guidance

Atorvastatin
Lipitor®

Increased Atorvastatin Exposure (SLCO1B1: Decreased Function) — **ACTIONABLE**

The patient's genotype is associated with possible increased atorvastatin exposure. Patients may be at an increased myopathy risk.

Consider starting atorvastatin at doses ≤40 mg. If doses >40 mg are needed, consider combination therapy (e.g., atorvastatin plus a non-statin guideline directed therapy).

Lovastatin
Mevacor®, Altoprev®, Advicor®

Increased Lovastatin Exposure (SLCO1B1: Decreased Function) — **ACTIONABLE**

The patient's genotype is associated with possible increased lovastatin exposure. Patients may be at an increased myopathy risk.
Consider an alternative statin based on disease-specific guidelines. If lovastatin use is warranted, consider limiting dose to ≤20 mg per day.

Pitavastatin
Livalo®

Increased Pitavastatin Exposure (SLCO1B1: Decreased Function) — **ACTIONABLE**

The patient's genotype is associated with possible increased pitavastatin exposure. Patients may be at an increased myopathy risk with doses >1 mg per day.

Consider starting pitavastatin at doses ≤2 mg. If doses >2 mg are needed, consider an alternative statin or combination therapy (e.g., pitavastatin plus a non-statin guideline directed medical therapy).

Simvastatin
Zocor®

Increased Simvastatin Exposure (SLCO1B1: Decreased Function) — **ACTIONABLE**

The patient's genotype is associated with possible increased simvastatin exposure. Patients may be at an increased myopathy risk with doses >20 mg.

Consider an alternative statin. If simvastatin use is warranted, consider limiting dose to <20 mg.

Thioridazine
Mellaril®

Increased Sensitivity to Thioridazine (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

Reduced cytochrome CYP2D6 activity results in elevated plasma levels of thioridazine, would be expected to augment the prolongation of the QTc interval associated with thioridazine, and may increase the risk of serious, potentially fatal, cardiac arrhythmias, such as Torsades de pointes-type arrhythmias. Such an increased risk may result also from the additive effect of coadministering thioridazine with other agents that prolong the QTc interval. Therefore, thioridazine is contraindicated in patients with reduced levels of CYP2D6 activity.

Amitriptyline
Elavil®

Increased Amitriptyline Exposure (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

The patient is predicted to be a CYP2D6 intermediate metabolizer which is likely to result in decreased metabolism of amitriptyline to less active compounds and a subsequent increase in amitriptyline exposure leading to side effects.

Psychiatric Conditions: Consider a 25% reduction of the recommended dose and use therapeutic drug monitoring to guide dose adjustments.

Neuropathic Pain: Amitriptyline therapy can be prescribed according to standard recommended dosage and administration when lower doses are considered. If higher doses are warranted, consider a 25% reduction of the recommended dose and monitor patient for side effects.

Amoxapine
Amoxapine®

Possible Increased Amoxapine Exposure (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

Like other tricyclic and tetracyclic antidepressants, amoxapine is metabolized by CYP2D6. However, the overall contribution of this enzyme in the metabolism of this drug is not well documented. Decreased CYP2D6 activity may result in higher amoxapine concentrations potentially leading to higher adverse events. There are no established dosing adjustments for patients with decreased CYP2D6 function; therapy must be initiated cautiously and adjusted according to the patient's response.

Atomoxetine

Strattera®

Possibly Increased Atomoxetine Exposure (CYP2D6: Intermediate Metabolizer) **ACTIONABLE**

The genotype result indicates that the patient may have an insufficient response due to inadequate drug exposure following standard dosing as compared with poor metabolizers.

Consider the following dosing strategy:

- Initiate treatment at 40 mg/day, then increase to 80 mg/day after 3 days.
- If after 2 weeks, optimal clinical response is not observed and adverse events are not present, consider a dose increase to 100 mg/day.
- If after an additional 2 weeks, optimal clinical response is not observed, consider therapeutic drug monitoring 1-2 hours post dose. If the plasma concentration is < 200 ng/mL, consider a proportional dose increase to approach 400 ng/mL. Doses > 100 mg/day may be needed to achieve a target therapeutic concentration (therapeutic range: 200-1,000 ng/mL). Note: doses above 120 mg/day have not been evaluated.

Benzhydrocodone

Apadaz®

Possible Decreased Exposure to Benzhydrocodone Active Metabolite (CYP2D6: Intermediate Metabolizer) **INFORMATIVE**

The patient's genotype may be associated with reduced conversion of benzhydrocodone to its active metabolite hydromorphone, which may result in decreased effectiveness; however, evidence is insufficient for clinical impact. Benzhydrocodone can be prescribed at standard label-recommended dosage and monitoring. If inadequate analgesic response and opioid use warranted, consider a non-codeine or non-tramadol opioid.

Bupropion

Wellbutrin®, Zyban®, Aplenzin®, Contrave®

Altered Bupropion Exposure (CYP2B6: Intermediate Metabolizer) **INFORMATIVE**

The genotype result indicates that the patient is likely to have increased bupropion exposure, but decreased exposure to the active metabolite (hydroxybupropion). This metabolite contributes to the therapeutic effects of bupropion when used as a smoking cessation agent or as an antidepressant. This decrease in exposure of hydroxybupropion may result in decreased therapeutic efficacy.

Smoking Cessation: There is insufficient data to allow calculation of dose adjustment. Consider standard prescribing and closer monitoring.

Major Depressive Disorder and Prevention of Seasonal Affective Disorder: There is insufficient data to allow calculation of dose adjustment. Therapeutic monitoring of bupropion-hydroxybupropion levels may be considered to guide dosing adjustments.

Clomipramine

Anafranil®

Increased Clomipramine Exposure (CYP2D6: Intermediate Metabolizer) **INFORMATIVE**

The patient is predicted to be a CYP2D6 intermediate metabolizer which is likely to result in decreased metabolism of clomipramine to less active compounds and a subsequent increase in clomipramine exposure leading to side effects.

Psychiatric Conditions: Consider a 25% reduction of the recommended dose and use therapeutic drug monitoring to guide dose adjustments.

Clozapine

Clozaril®

Non-Response to Clozapine (CYP1A2: Normal Metabolizer - Higher Inducibility) **INFORMATIVE**

Smokers have a high risk for non-response at standard doses and may require higher doses. There is an association between high clozapine doses and the risk of seizures, and therefore careful monitoring is recommended during dosing adjustment. Smoking cessation will increase plasma drug levels, leading to adverse events. Therefore, therapeutic drug monitoring accompanied by dose reduction is recommended in patients who have quit smoking.

Codeine

Codeine; Fioricet® with Codeine

Decreased Exposure to Codeine Active Metabolite (CYP2D6: Intermediate Metabolizer) **ACTIONABLE**

The patient genotype is associated with decreased conversion of codeine to its active metabolite (morphine), which may result in decreased effectiveness.

Codeine can be prescribed at standard label-recommended age- or weight-based dosing. If no response and opioid use is warranted, consider a non-tramadol opioid. Alternative opioids may include: fentanyl, morphine, hydromorphone, oxymorphone, and tapentadol.

Desipramine

Increased Desipramine Exposure (CYP2D6: Intermediate Metabolizer) **INFORMATIVE**

Norpramin®

The patient is predicted to be a CYP2D6 intermediate metabolizer which is likely to result in decreased metabolism of desipramine to less active compounds and a subsequent increase in desipramine exposure leading to side effects.

Psychiatric Conditions: Consider a 25% reduction of the recommended dose and use therapeutic drug monitoring to guide dose adjustments.

Dexlansoprazole

Dexilant®, Kapidex®

Normal or Possible Slightly Decreased Exposure to Dexlansoprazole (CYP2C19: Normal Metabolizer) — **INFORMATIVE**

The patient's genotype is predictive of normal metabolism but may be associated with a slightly decreased dexlansoprazole clinical exposure following standard dosing. Be alert for insufficient response, consider prescribing dexlansoprazole at standard label-recommended dosage and administration. May consider increasing the recommended dose for certain indications by 50-100% to optimize therapeutic efficacy.

Dexmethylphenidate

Focalin®

Decreased Response to Dexmethylphenidate (COMT: Intermediate COMT Activity) — **INFORMATIVE**

The patient's genotype result predicts a less optimal response to dexmethylphenidate. Dosage should be individualized according to the needs and response of the patient. Therapy should be initiated in small doses, with gradual weekly increments.

Doxepin

Silenor®

Increased Doxepin Exposure (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

The patient is predicted to be a CYP2D6 intermediate metabolizer which is likely to result in decreased metabolism of doxepin to less active compounds and a subsequent increase in doxepin exposure leading to side effects.

Psychiatric Conditions: Consider a 25% reduction of the recommended dose and use therapeutic drug monitoring to guide dose adjustments.

Insomnia: Doxepin can be prescribed according to the standard recommended dosage and administration.

Efavirenz

Sustiva®

Increased Efavirenz Exposure (CYP2B6: Intermediate Metabolizer) — **ACTIONABLE**

The genotype result indicates that the patient is likely to have higher dose-adjusted trough concentrations of efavirenz following standard dosing. This may result in increased risk of CNS adverse events. Consider initiating efavirenz with a decreased dose of 400 mg/day. If therapeutic drug monitoring is available and a decreased efavirenz dose is prescribed, consider obtaining steady-state plasma efavirenz concentrations to ensure concentrations are in the suggested therapeutic range (~1 to 4 µg/mL).

Fentanyl

Actiq®

Possible Decreased Response to Fentanyl (OPRM1: Altered OPRM1 Function) — **INFORMATIVE**

The genotype result indicates that the patient is heterozygous for the OPRM1 rs1799971 G allele. Preliminary studies suggest the patient's genotype may be associated with reduced analgesia at standard fentanyl doses, but overall evidence is weak and conflicting. And multiple factors contribute to variability in fentanyl response including age, psychological status, tolerance, condition and duration, genetics, and opioid use. Consider prescribing fentanyl at standard label-recommended dosage and monitor closely.

Flecainide

Tambocor®

Increased Exposure to Flecainide (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

The patient's genotype may be associated with an increased flecainide exposure following standard dosing. Consider prescribing a lower flecainide dose for therapeutic indications. When compared to a CYP2D6 normal metabolizer, an intermediate metabolizer may require a 25% dose reduction. Careful titration with ECG recording and monitoring of flecainide plasma concentrations are recommended until a favorable clinical response is achieved.

Dose adjustments are not required when flecainide is utilized for diagnostic uses.

Fluvastatin

Lescol®

Increased Fluvastatin Exposure (SLCO1B1: Decreased Function; CYP2C9: Normal Metabolizer) — **ACTIONABLE**

The patient's genotype is associated with possible increased fluvastatin exposure. Fluvastatin can be prescribed at standard label-recommended dosage and administration, but patients may be at an increased risk for myopathy with doses >40 mg per day.

Fluvoxamine
Luvox®

Increased Fluvoxamine Exposure (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

The patient's genotype is associated with an increased exposure to fluvoxamine, which may increase risk of adverse effects. Fluvoxamine can be prescribed at standard label-recommended dosage with close monitoring.

Hydrocodone
Vicodin®

Altered Response to Hydrocodone (OPRM1: Altered OPRM1 Function) — **INFORMATIVE**

The patient carries one copy of the OPRM1 118A>G variant. Acute postoperative and cancer pain: the patient's genotype has been shown to be associated with reduced analgesia and increased opioid side effects at standard or high hydrocodone doses. If the patient fails to respond to increased hydrocodone doses, an alternative opioid may be considered.

Hydrocodone
Vicodin®

Possible Decreased Exposure to Hydrocodone Active Metabolite (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

The patient genotype may be associated with a reduced conversion of hydrocodone to an active metabolite (hydromorphone), which may result in decreased effectiveness.

Hydrocodone can be prescribed at standard label-recommended age- or weight-based dosing. If no response and opioid use is warranted, consider a non-codeine or non-tramadol opioid. Alternative opioids may include: fentanyl, morphine, hydromorphone, oxymorphone, and tapentadol.

Iloperidone
Fanapt®

Moderate Sensitivity to Iloperidone (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

Because iloperidone is associated with QTc prolongation, caution is warranted when prescribing the drug in patients with reduced CYP2D6 activity. Iloperidone must be titrated slowly from a low starting dose to avoid orthostatic hypotension. If patients taking iloperidone experience symptoms that could indicate the occurrence of cardiac arrhythmias (e.g., dizziness, palpitations, or syncope), the prescriber should initiate further evaluation, including cardiac monitoring.

Imipramine
Tofranil®

Increased Imipramine Exposure (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

The patient is predicted to be a CYP2D6 intermediate metabolizer which is likely to result in decreased metabolism of imipramine to less active compounds and a subsequent increase in imipramine exposure leading to side effects.

Psychiatric Conditions: Consider a 25% reduction of the recommended dose and use therapeutic drug monitoring to guide dose adjustments.

Lansoprazole
Prevacid®

Normal or Possible Slightly Decreased Exposure to Lansoprazole (CYP2C19: Normal Metabolizer) — **ACTIONABLE**

The patient's genotype is predictive of normal metabolism but may be associated with a slightly decreased lansoprazole clinical exposure following standard dosing. Be alert for insufficient response, consider prescribing lansoprazole at standard label-recommended dosage and administration. May consider increasing the recommended dose for certain indications by 50-100% to optimize therapeutic efficacy.

Lorazepam
Ativan®

Possible Altered Response to Lorazepam (UGT2B15: Poor Metabolizer) — **INFORMATIVE**

Lorazepam clearance is reduced in this patient. However, there is insufficient evidence whether this change results in a significant clinical effect. Consider monitoring the patient for increased sedation and adjust dosing accordingly.

Maprotiline
Ludiomil®

Possible Increased Maprotiline Exposure (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

Like other tricyclic and tetracyclic antidepressants, maprotiline is metabolized by CYP2D6 as well as CYP1A2. Decreased CYP2D6 activity results in higher maprotiline concentrations potentially leading to higher adverse events. There are no established dosing adjustments for patients with decreased CYP2D6 function therefore, therapy must be initiated at a low dosage and gradually adjusted according to the patient's response. The lowest effective dosage should always be considered during maintenance therapy.

Methadone
Dolophine®

Increased Methadone Exposure (CYP2B6: Intermediate Metabolizer) — **INFORMATIVE**

The patient's genotype may be associated with an increased methadone exposure and increased risk of adverse effects in the treatment of opioid use disorder, but overall evidence is weak. Methadone can be prescribed at standard label-recommended dosage with close monitoring.

Methotrexate
Trexall®

Increased Risk for Methotrexate Toxicity (MTHFR: Reduced MTHFR Activity) — **INFORMATIVE**

The patient carries one copy of the MTHFR c.665C>T variant resulting in a reduced MTHFR activity. **Malignancy:** Leukemia or lymphoma patients who are treated with methotrexate standard regimens might have an increased likelihood of treatment interruptions due to methotrexate toxicity. Monitor the patient closely for increased side effects and adjust the dose accordingly. Other genetic and clinical factors may also influence the patient's risk for toxicity and response to methotrexate treatment. **Nonmalignant conditions:** a limited number of studies found an association between individuals carrying the MTHFR c.665C>T variant and methotrexate-induced toxicity in rheumatoid arthritis patients. However, there is insufficient data to calculate dose adjustment. Monitor patient closely for increased side effects and adjust the dose accordingly. Other genetic and clinical factors may also influence the patient's risk for toxicity and response to methotrexate treatment.

Methylphenidate
Ritalin®, Aptensio XR®, Concerta®, Metadate ER®, Quillivant ER®

Decreased Response to Methylphenidate (COMT: Intermediate COMT Activity) — **INFORMATIVE**

The patient's genotype result predicts a less optimal response to methylphenidate. Dosage should be individualized according to the needs and response of the patient. Therapy should be initiated in small doses, with gradual weekly increments.

Metoclopramide
Reglan®

Possible Sensitivity to Metoclopramide (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

There is no data documenting the changes in plasma concentrations of metoclopramide in CYP2D6 intermediate metabolizers. Metoclopramide can be prescribed at standard label-recommended dosage and administration with careful monitoring for possible increase of side effects.

Metoprolol
Lopressor®

Increased Exposure to Metoprolol (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

The patient's genotype may be associated with an increased metoprolol exposure following standard dosing. When compared to a normal metabolizer, an intermediate metabolizer may require a 50% dose reduction. If metoprolol is prescribed, be alert to adverse events (e.g., bradycardia or cold extremities).

Mexiletine
Mexitil®

Increased Sensitivity to Mexiletine (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

Consider prescribing a lower mexiletine dose. A slow titration with ECG recording and monitoring of mexiletine plasma concentrations are recommended until a favorable clinical response is achieved.

Nortriptyline
Pamelor®

Increased Nortriptyline Exposure (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

The patient is predicted to be a CYP2D6 intermediate metabolizer which is likely to result in decreased metabolism of nortriptyline to less active compounds and a subsequent increase in nortriptyline exposure leading to side effects.

Psychiatric Conditions: Consider a 25% reduction of the recommended dose and use therapeutic drug monitoring to guide dose adjustments.

Olanzapine
Zyprexa®

Non-Response to Olanzapine (CYP1A2: Normal Metabolizer - Higher Inducibility) — **INFORMATIVE**

There is little evidence regarding the impact of CYP1A2 genetic variants on olanzapine response. Smokers may be at risk for non-response at standard doses. Careful monitoring is recommended during dosing adjustment. Smoking cessation may increase plasma drug levels, leading to adverse events. Therefore, therapeutic drug monitoring accompanied by dose reduction may be needed in patients who have quit smoking.

Omeprazole

Prilosec®

Normal or Possible Slightly Decreased Exposure to Omeprazole (CYP2C19: Normal Metabolizer) — **ACTIONABLE**

The patient's genotype is predictive of normal metabolism but may be associated with a slightly decreased omeprazole clinical exposure following standard dosing. Be alert for insufficient response, consider prescribing omeprazole at standard label-recommended dosage and administration. May consider increasing the recommended dose for certain indications by 50-100% to optimize therapeutic efficacy.

Oxazepam

Serax®

Possible Altered Response to Oxazepam (UGT2B15: Poor Metabolizer) — **INFORMATIVE**

Oxazepam clearance is reduced in this patient. However, there is insufficient evidence whether this change results in a significant clinical effect. Consider monitoring the patient for increased sedation and adjust dosing accordingly.

Pantoprazole

Protonix®

Normal or Possible Slightly Decreased Exposure to Pantoprazole (CYP2C19: Normal Metabolizer) — **ACTIONABLE**

The patient's genotype is predictive of normal metabolism but may be associated with a slightly decreased pantoprazole clinical exposure following standard dosing. Be alert for insufficient response, consider prescribing pantoprazole at standard label-recommended dosage and administration. May consider increasing the recommended dose for certain indications by 50-100% to optimize therapeutic efficacy.

Paroxetine

Paxil®, Brisdelle®

Increased Paroxetine Exposure (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

The patient's genotype is associated with an increased exposure to paroxetine when starting treatment or at lower doses, which may increase risk of adverse effects. Consider prescribing paroxetine at a lower starting dose and slower up-titration with close monitoring.

Perphenazine

Trilafon®

Possible Sensitivity to Perphenazine (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

Patients with a decreased CYP2D6 function will eliminate perphenazine more slowly, which can result in higher drug concentrations and possibly more adverse events (extrapyramidal symptoms). Consider close monitoring and dose reduction to avoid toxicity.

Pravastatin

Pravachol®

Increased Pravastatin Exposure (SLCO1B1: Decreased Function) — **ACTIONABLE**

The patient's genotype is associated with possible increased pravastatin exposure. Pravastatin can be prescribed at standard label-recommended dosage and administration, but patients may be at an increased myopathy risk with doses >40 mg per day.

Propafenone

Rythmol®

Increased Exposure to Propafenone (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

The patient's genotype may be associated with an increased propafenone exposure following standard dosing. There is insufficient data to allow calculation of dose adjustment. Titrate carefully and adjust the dose in response to plasma concentration and ECG monitoring. An alternative medication such as sotalol, disopyramide, quinidine or amiodarone may also be considered.

Dose adjustments with co-medications: concurrent use of propafenone along with CYP3A4 inhibitors and CYP2D6 inhibitors may significantly increase the plasma concentration of propafenone increasing the risk of proarrhythmia and other adverse events. Therefore, avoid simultaneous use of propafenone with both a CYP2D6 inhibitor and a CYP3A4 inhibitor.

Protriptyline

Vivactil®

Possible Increased Protriptyline Exposure (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

Like other tricyclic and tetracyclic antidepressants, protriptyline is metabolized by CYP2D6. Decreased CYP2D6 activity results in higher protriptyline concentrations potentially leading to higher adverse events. There are no established dosing adjustments for patients with decreased CYP2D6 function. Therefore, therapy must be initiated at a low dosage and gradually adjusted according to the patient's response. The lowest effective dosage should always be considered during maintenance therapy.

Rosuvastatin
Crestor®

Increased Rosuvastatin Exposure (SLCO1B1: Decreased Function) — **ACTIONABLE**

The patient's genotype is associated with possible increased rosuvastatin exposure. Rosuvastatin can be prescribed at standard label-recommended dosage and administration, but patients may be at an increased myopathy risk with doses >20 mg.

Sertraline
Zoloft®

Increased Sertraline Exposure (CYP2C19: Normal Metabolizer; CYP2B6: Intermediate Metabolizer) — **ACTIONABLE**

The patient's genotype is associated with an increased exposure to sertraline and may increase risk of adverse effects. Sertraline can be initiated at standard label-recommended dosage. Consider slow up-titration and lower than standard label-recommended maintenance doses.

Tetrabenazine
Xenazine®

Normal Sensitivity to Tetrabenazine (CYP2D6: Intermediate Metabolizer) — **ACTIONABLE**

For treating chorea associated with Huntington's disease: Individualization of dose with careful weekly titration is required. The first week's starting dose is 12.5 mg daily; second week, 25 mg (12.5 mg twice daily); then slowly titrate at weekly intervals by 12.5 mg to a tolerated dose. **The maximum daily dose in CYP2D6 intermediate metabolizers of CYP2D6 is 100 mg with a maximum single dose of 37.5 mg**. If serious adverse events occur, titration should be stopped and the dose of tetrabenazine should be reduced. If the adverse event(s) do not resolve, consider withdrawal of tetrabenazine.

Timolol
Blocadren®

Possible Sensitivity to Timolol (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

Potentiated systemic beta-blockade (e.g., bradycardia) has been reported during timolol treatment by patients with decreased CYP2D6 activity. Monitor patient for treatment-related adverse effects.

Tizanidine
Zanaflex®

Possible Non-Response to Tizanidine (CYP1A2: Normal Metabolizer - Higher Inducibility) — **INFORMATIVE**

There is little evidence regarding the impact of CYP1A2 genetic variants on tizanidine response. Smokers may be at risk for non-response and may require higher doses. There is an association between high tizanidine plasma concentrations and the risk of hypotension and excessive sedation. Therefore, careful monitoring is recommended during dosing adjustment. Smoking cessation may increase plasma drug levels, leading to excessive hypotension and sedation. Careful monitoring accompanied by dose reduction may be needed in patients who have quit smoking.

Tramadol
Ultram®

Decreased Exposure to Tramadol Active Metabolite (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

The patient genotype is associated with decreased conversion of tramadol to its active metabolite (O-desmethyltramadol), which may result in decreased effectiveness.

Tramadol can be prescribed at standard label-recommended age- or weight-based dosing and monitoring. If no response and opioid use is warranted, consider a non-codeine opioid. Alternative opioids may include: fentanyl, morphine, hydromorphone, oxymorphone, and tapentadol.

Trimipramine
Surmontil®

Increased Trimipramine Exposure (CYP2D6: Intermediate Metabolizer) — **INFORMATIVE**

The patient is predicted to be a CYP2D6 intermediate metabolizer which is likely to result in decreased metabolism of trimipramine to less active compounds and a subsequent increase in trimipramine exposure leading to side effects.

Psychiatric Conditions: Consider a 25% reduction of the recommended dose and use therapeutic drug monitoring to guide dose adjustments.

Vortioxetine

Trintellix®

Increased Vortioxetine Exposure (CYP2D6: Intermediate Metabolizer) **ACTIONABLE**

The patient's genotype is associated with an increased exposure to vortioxetine, which may increase risk of adverse effects. Vortioxetine can be prescribed at standard label-recommended dosage with close monitoring.

Test Details

Gene	Genotype	Phenotype	Clinical Consequences
ANKK1/DRD2	DRD2:Taq1A G/G	**Unaltered DRD2 function**	Consistent with a normal dopamine receptor D2 function.
APOE	ε3/ε3	**Normal APOE function**	Not associated with type III hyperlipoproteinemia - No increased risk of cardiovascular disease
COMT	Val158Met A/G	**Intermediate COMT Activity**	Consistent with a reduced catechol O-methyltransferase (COMT) function.
CYP1A2	*1F/*1F	**Normal Metabolizer - Higher Inducibility**	Consistent with a typical CYP1A2 activity in absence of inducing substances. Rapid Metabolism occurs in presence of inducers such as barbiturates, cruciferous vegetables, carbamazepine, rifampin and smoking.
CYP2B6	*1/*6	**Intermediate Metabolizer**	Consistent with a moderate deficiency in CYP2B6 activity. Potential risk for side effects or loss of efficacy with drug substrates.
CYP2C19	*1/*1	**Normal Metabolizer**	Consistent with a typical CYP2C19 enzyme activity.
CYP2C9	*1/*1	**Normal Metabolizer**	Consistent with a typical CYP2C9 enzyme activity.
CYP2D6	*1/*5	**Intermediate Metabolizer**	Consistent with a moderate deficiency in CYP2D6 enzyme activity.
CYP3A4	*1/*1	**Normal Metabolizer**	Consistent with a typical CYP3A4 activity. Caution is advised when prescribing narrow therapeutic index drugs. Alternative drugs or dose adjustment may be required if CYP3A inhibitors or inducers are co-prescribed.
CYP3A5	*3/*3	**Poor Metabolizer**	Consistent with an absence of CYP3A5 enzyme expression (Non-Expresser). This phenotype is the most common in the general population.
CYP4F2	c.1297G>A G/G	**Normal Activity**	Consistent with a typical CYP4F2 protein expression, resulting in normal vitamin K metabolism.
F2 **F5**	rs1799963 GG rs6025 CC	**Normal Risk of Thrombosis**	Unless other genetic or circumstantial risk factors are present, the patient is not expected to have an increased risk for thrombosis.
HTR2A	-1438G>A C/T	**Heterozygous for the T Allele (rs6311)**	The patient carries one copy of the variant allele at rs6311 which may be associated with greater serotonin 2A receptor gene expression.
HTR2A	rs7997012 A/A	**Homozygous for the A allele (rs7997012)**	Possible increased response to citalopram and escitalopram
MTHFR	c.665C>T GA	**Reduced MTHFR Activity**	The patient carries one copy of the MTHFR c.665C>T variant (heterozygous) and the patient's MTHFR activity is reduced slightly. This is not associated with an increased risk of hyperhomocysteinemia.
MTHFR	c.1286A>C GT c.665C>T GA	**No Increased Risk of Hyperhomocysteinemia**	The patient is heterozygous for both the MTHFR c.665C>T and c.1286A>C variants. The MTHFR activity is reduced, but the results are not associated with an increased risk for hyperhomocysteinemia.
NUDT15	*1/*1	**Normal Metabolizer**	Consistent with a typical NUDT15 activity.
OPRM1	A118G A/G	**Altered OPRM1 Function**	Consistent with a reduced OPRM1 receptor signaling efficiency induced by exogenous opioids. This is associated with a possible reduced analgesia following standard opioid doses and a favorable response to naltrexone.
SLCO1B1	*1/*5	**Decreased Function**	Consistent with a decreased SLCO1B1 transporter function. Exercise caution when certain SLCO1B1 drug substrates are prescribed.
TPMT	*1/*1	**Normal Metabolizer**	Consistent with a typical TPMT activity.
UGT2B15	*2/*2	**Poor Metabolizer**	Consistent with a decreased UGT2B15 glucuronidation function. Potential risk for side effects with drug substrates.
VKORC1	-1639G>A G/A	**Intermediate Warfarin Sensitivity**	Consistent with a moderately decreased VKORC1 expression. Exercise caution with coumarin anticoagulants.

Alleles Tested: ANKK1/DRD2 DRD2:Taq1A; **APOE** ε2, ε4, (ε3 is reference); **COMT** Val158Met; **CYP1A2** *1C, *1D, *1F, *1K, *1L, *1V, *1W; **CYP2B6** *6, *9, *18, *18.002; **CYP2C19** *2, *3, *4A, *4B, *5, *7, *8, *9, *17; **CYP2C9** *2, *3, *4, *5, *6, *8, *11; **CYP2D6** *2, *3, *4, *4M, *6, *7, *8, *9, *10, *12, *14, *17, *29, *35, *41, *114, *5 (gene deletion), XN (gene duplication); **CYP3A4** *22; **CYP3A5** *3, *6, *7; **CYP4F2** c.1297G>A; **F2** rs1799963; **F5** rs6025; **HTR2A** -1438G>A, rs7997012; **MTHFR** c.1286A>C, c.665C>T; **NUDT15** *2, *3, *5; **OPRM1** A118G; **SLCO1B1** *5; **TPMT** *2, *3A, *3B, *3C, *4; **UGT2B15** *2; **VKORC1** -1639G>A

Disclaimer Molecular Diagnostics developed the genotyping-based test. The performance characteristics of this test were determined by Molecular Diagnostics. It has not been cleared or approved by the U.S. Food and Drug Administration (FDA).

Only a qualified healthcare professional should advise a patient on how to interpret the results and information found in this report. Molecular Diagnostics will not make any recommendations based on the results of the test performed, therefore, please seek advice from your healthcare provider.

Methodology: All single nucleic polymorphism (SNP) genotyping was performed using Applied BiosystemsTM TaqMan® chemistry on the QuantStudioTM 12K Flex Real-Time PCR System from ThermoFisher Scientific. Array based assays detects listed alleles, including all common and most rare variants with known clinical significance at analytical sensitivity and specificity >99%.

Limitations: This test will not detect all the known alleles that result in altered or inactive tested genes. This test does not account for all individual variations in the individual tested. Absence of a detectable gene mutation does not rule out the possibility that a patient has different phenotypes due to the presence of an undetected polymorphism or due to other factors such as drug-drug interactions, comorbidities and lifestyle habits.

The information presented on this report is provided as general educational health information. The content is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Only a physician, pharmacist or other healthcare professional should advise a patient on the use of the medications prescribed.

The pharmacogenetic assay involves use of reporting software and genotype-phenotype associations performed The software has not been evaluated by the Food and Drug Administration. The software, and the report generated by the software, is not intended to diagnose, treat, cure, or prevent any disease. A qualified designee within the lab uses to generate and subsequently review the report. The pharmacogenetic report is one of multiple pieces of information that clinicians should consider in guiding their therapeutic choice for each patient. It remains the responsibility of the health-care provider to determine the best course of treatment for a patient. Adherence to dose guidelines does not necessarily assure a successful medical outcome.

PATIENT INFORMATION

NAME:
ACC #: M23001760
DOB: 3/30
SEX: Female

Patient Information Card

This is a summary genetic report for your patient to share with other healthcare providers. The card can be cut out along the dashed line and carried with the patient.

REPORT DETAILS

Patient: SUMMER
DOB: 3/30
ACC #: M23001760

Pharmacogenetic Test Summary

CYP2C19	*1/*1	Normal Metabolizer
CYP2C9	*1/*1	Normal Metabolizer
CYP2D6	*1/*5	Intermediate Metabolizer
CYP3A4	*1/*1	Normal Metabolizer
CYP3A5	*3/*3	Poor Metabolizer

MTHFR	c.665C>T GA	Reduced MTHFR Activity
MTHFR	c.1286A>C GT c.665C>T GA	No Increased Risk of Hyperhomocysteinemia
VKORC1	-1639G>A G/A	Intermediate Warfarin Sensitivity

For a complete report contact Resolve Molecular Diagnostics