

Patient: **Jerry Atrik** Sample ID: 9800902064

Patient DOB: 12/25/1955 250737 Accession ID:

Ordering Clinician: **Genomind Clinician** Sample Collection Date: 4/18/2023

Sample Type: Buccal Sample Received Date: 4/19/2023

Assay Ordered: Genomind PGx (v3.2) Report Date: 4/19/2023 1:31 PM

## **Understanding this report:**

- Current medications that have a higher risk drug-drug or drug-gene interaction
- Pharmacogenetic (PGx) risk categorization of common medications across different conditions
- Gene result overview

# Actionable interactions

Usually have specific

PGx (dose adjustment,

alternative drug

recommendations based on

considerations or increased



Higher Risk: large changes in drug blood levels

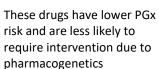


Contraindication



Responsible for major drug-drug interactions

# No to moderate interactions





No detected interactions



Lower Risk: small changes in drug blood levels



Moderate Risk: moderate changes in drug blood levels

#### Legend:

monitoring)

Additional information about the nature of the gene-drug interaction



Increased Efficacy



Decreased Efficacy



Weight Gain



Actionable PGx Guidelines



Therapeutic Duplication

### Contact us: 877-895-8658 • genomind.com • customerservice@genomind.com

Disclaimer: This summary page sorts medications based solely on pharmacogenetic parameters and drug category. Pharmacogenetics is only one factor to consider when prescribing medications and you, as the prescriber, are ultimately responsible for evaluating other patient characteristics. This includes, but is not limited to, proper diagnosis, comorbidities, drug-drug interactions, medical history, contraindications, and other factors. Never rely solely on PGx to make any medication decisions. This test was developed, and its performance characteristics determined by Genomind. It has not been cleared or approved by the US Food and Drug Administration.

Antidepressants are placed into respective categories consistent with CANMAT depression guidelines https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4994790/#!po=9.25926

Anxiety medications are placed into respective categories based on a modified AAFP GAD Treatment Algorithm https://www.aafp.org/pubs/afp/issues/2015/0501/p617.html

Literature information reviewed by: Electronically signed by:

Genomind, INC., 2200 Renaissance Blvd., Suite 100, King of Prussia, PA 19406. CLIA number 39D2088097, CAP number 9046391



# 1. Current risk medications

The following medications were listed as current on the patient requisition form and have a higher risk drug-drug or drug-gene interaction. We have identified up to 5 alternative medications, ranked by their interaction risk. For additional alternative medications use our drug-gene interaction software **GenMedPro**.

RISK LEVEL	MEDICATION ASSESSMENT	POSSIBLE ALTERNATIVES (Based on USP classification)	
Δ	Clopidogrel Potential increase in Clopidogrel serum levels: Decrease in active metabolites  Due to: 2C19 Poor metabolizer, 3A4/5 Low activity	Prasugrel  Ticlopidine  Ticagrelor	
Δ	Ibuprofen Potential increase in Ibuprofen serum levels: May require lower doses  Due to: 2C9 Poor metabolizer	Aspirin  Diflunisal  Etodolac  Fenoprofen  Ketoprofen	
Δ	Rosuvastatin Potential increase in Rosuvastatin serum levels: May require lower doses  Due to: ABCG2 Poor function	Pitavastatin  Pravastatin  Lovastatin  Simvastatin  Atorvastatin	

This medication list was provided on 4/18/2023.

# 2. PGx risk categorization

# **Actionable gene-drug interactions**

### **Antidepressants (1st line)**



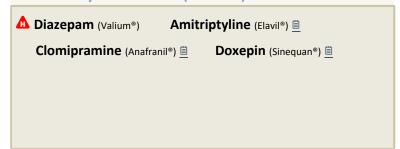
## **Antidepressants (2nd line or augmentation)**



### Anti-anxiety medications (1st line)



### **Anti-anxiety medications (2nd line)**



# No to moderate gene-drug interactions

### **Antidepressants (1st line)**

i Fluvoxamine (Luvox®) ជា	Paroxetine (Paxil®) ส์เ
Bupropion (Wellbutrin®)	Duloxetine (Cymbalta®)
▲ Mirtazapine (Remeron®)	Vortioxetine (Trintellix®)
⚠ Fluoxetine (Prozac®) ជា	Venlafaxine (Effexor®)

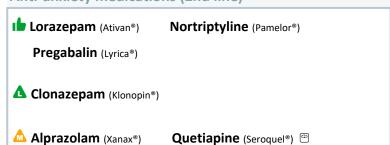
## **Antidepressants (2nd line or augmentation)**



#### Anti-anxiety medications (1st line)



### **Anti-anxiety medications (2nd line)**



# **Actionable gene-drug interactions**

#### **ADHD**

No major interactions.

#### Statin

Atorvastatin (Lipitor®) Fluvastatin (Lescol®) E

Rosuvastatin (Crestor®)

#### **B-blocker**

No major interactions.

#### **Non-opioid Analgesics**

Celecoxib (Celebrex®) ☐ Flurbiprofen (Ansaid®) ☐ Ibuprofen (Motrin®) ☐ Meloxicam (Mobic®) ☐ Piroxicam (Feldene®) ☐

### **Opioids**

No major interactions.

# **Proton Pump Inhibitors**

Dexlansoprazole (Dexilant®) Lansoprazole (Prevacid®)

# No to moderate gene-drug interactions

#### **ADHD**

Amphetamine-Dextroamphetamine (Adderall®)

Atomoxetine (Strattera®) Clonidine ER (Kapvay®)

Dextroamphetamine (Dexedrine®)

Lisdexamfetamine (Vyvanse®) Viloxazine (Qelbree®)

Dexmethylphenidate (Focalin®) ii:

Methylphenidate (Ritalin®) ii:

#### Statin

Pitavastatin (Livalo®)

Pravastatin (Pravachol®)

Lovastatin (Mevacor®)

Simvastatin (Zocor®)

#### **B-blocker**

Atenolol (Tenormin®)

Carvedilol (Coreg®)

Nebivolol (Bystolic®)

Bisoprolol (Ziac®)

Metoprolol (Toprol®)

### **Non-opioid Analgesics**

Acetaminophen (Tylenol®)

Ketorolac (Toradol®)

Nabumetone (Relafen®)

Diclofenac (Voltaren®)

Naproxen (Aleve®)

### **Opioids**

Morphine (MS Contin®)

Tapentadol (Nucynta®)

⚠ Tramadol (Ultram®)

Mydromorphone (Dilaudid®)

Oxymorphone (Unbranded)

Tapentadol (Nucynta®)

Mydrocodone (Hysingla ER®)

Oxycodone (Oxycontin®)

### **Proton Pump Inhibitors**

▲ Esomeprazole (Nexium®) Rabeprazole (Aciphex®)



# **Actionable gene-drug interactions**

## **Antiplatelet**

⚠ Clopidogrel (Plavix®) 🖺

# **Anticoagulants**

**⚠** Warfarin (Coumadin®) <u>■</u>

# **Genitourinary**

No major interactions.

# Nausea / Vomiting

⚠ Dronabinol (Marinol®) 🗏

# No to moderate gene-drug interactions

## **Antiplatelet**

► Prasugrel (Effient®) Ticlopidine (Unbranded)

Ticagrelor (Brilinta®)

# **Anticoagulants**

**⚠ Dabigatran** (Pradaxa®) **Edoxaban** (Savaysa®)

▲ Apixaban (Eliquis®) Rivaroxaban (Xarelto®)

### **Genitourinary**

Flavoxate (Urispas®) Trospium (Sanctura®)

▲ Mirabegron (Myrbetriq®) Tolterodine (Detrol®)

▲ Darifenacin (Enablex®)
 Fesoterodine (Toviaz®)
 Oxybutynin (Ditropan®)
 Solifenacin (Vesicare®)

## Nausea / Vomiting

Dolasetron (Anzemet®) Metoclopramide (Reglan®)

Palonosetron (Aloxi®) Prochlorperazine (Compazine®)

Promethazine (Promethegan®)

**⚠** Granisetron (Sancuso®) Ondansetron (Zofran®)

Rolapitant (Varubi®)

**△** Aprepitant (Emend®)

# 3. Gene results overview

Pharmacokinetic Genes (Drug Metabolism / Drug Absorption)

Gene	Genotype	Phenotype	Impact
ABCB1	A/A	NF	Normal exposure is expected
ABCB1 C3435T	G/G	NF	Normal exposure is expected
ABCG2	T/T	PF	Increased exposure to certain medications
CYP1A2	*1B/H7	NM	Normal metabolism is expected
CYP2B6	*1/*1	NM	Normal metabolism is expected
CYP2C19	*2/*3	PM	Risk of increased (个) drug levels
CYP2C9	*2/*3	PM	Risk of increased (个) drug levels
CYP2D6	*1/*1	NM	Normal metabolism is expected
CYP3A4/5	*22/*22, *3/*3	LA	Risk of increased (个) drug levels
SLCO1B1	*1/*1	NF	Normal exposure is expected
UGT1A4	*1a/*1a	NM	Normal metabolism is expected
UGT2B15	*1/*2	NM	Normal metabolism is expected

# Antidepressant Response

Gene	Result	Impact
BDNF	Val/Val	Moderately lower odds of response to SSRIs in East Asians
HTR2A	G/A	No known significant clinical impact
MTHFR	C677T: T/T A1298C: A/A	Reduced MTHFR activity and methylfolate production
SLC6A4	L(A)/L(A)	Higher odds of efficacy with SSRIs across most ancestry groups

# Attention-deficit/hyperactivity disorder Response

	Gene	Result	Impact
•	ADRA2A	C/C	Lower odds of response to methylphenidate for inattentive symptoms of ADHD
	СОМТ	Val/Met	No known significant clinical impact

# Antipsychotic Response and Tolerability

	Gene	Result	Impact
)	DRD2	C/DEL	Higher risk of poor/delayed response and weight gain with certain antipsychotics in psychotic disorders
)	HTR2C	T/T	Lower risk of weight gain with 2nd generation antipsychotics
	MC4R	A/A	Higher risk of weight gain with certain 2nd generation antipsychotics
	Other		

### Other

Pharmacodynamic Genes (Drug Targets / Mechanisms)

Gene	Result	Impact
ANK3	T/T	May prompt consideration of mood stabilizers if indicated
CACNA1C	G/G	No known significant clinical impact
GRIK1	A/A	No known significant clinical impact
HLA-A *31:01	Negative	No known significant clinical impact
HLA-B *15:02	Negative	No known significant clinical impact
OPRM1	A/G	No known significant clinical impact

# **Test Methodology/Literature References**

### **Test Methodology**

This test was developed and performance characteristics were validated in the Genomind clinical laboratory. This test has not been cleared or approved by the U.S. Food and Drug Administration (FDA). This test is used for clinical purposes and should not be regarded as investigational or for research use. Genomind's laboratory is certified under the Clinical Laboratory Improvement Amendments (CLIA), as qualified to perform high complexity clinical laboratory testing. Genomind performed the testing using standard and custom TaqMan reagents for all variants. The test results are intended to be used as prognostic and not diagnostic and are not intended as the sole means for patient management decisions.

Test Methodology Limitations: Factors influencing the amount and quality of DNA extracted include but are not limited to the amount of buccal cells extracted, patient oral hygiene, collection technique, and the presence of dietary or microbial sources of nucleic acids and nucleases. DNA quality and quantity are subject to matrix dependent influences. PCR inhibitors, extraneous DNA and nucleic acid degrading enzymes are all factors which may affect the evaluation of assay results. Some single nucleotide polymorphism (SNP) assays are problematic due to multiple base repeats and other sequence aberrations, which may hinder proper amplification and analysis. DNA purity can influence the assay. SLC6A4 contains many polymorphisms, and the assay was developed and validated according to the current available scientific information. For pharmacogenetic tests like the Genomind Pharmacogenetic Report, undetected genetic and/or non-genetic factors such as drug-drug interactions may impact the phenotype. In liver transplant recipients, certain genotypes of the donor liver may not be the same as those of the recipient. In these cases, it may be necessary to account for both the donor and recipient genotypes when evaluating drug metabolism genes. However, studies to date have been inconclusive as to the relative influence of the donor and recipient genotypes. The Genomind Pharmacogenetic Report is based on a current understanding of the clinical relevance of the variant identified, penetrance, phenotype predictions, and recurrence risks.

Variants tested include ABCB1 C3435T rs1045642; ABCB1 rs2032583; ABCG2 rs2231142, ADRA2A rs1800544; ANK3 rs10994336; BDNF rs6265; CACNA1C rs1006737; COMT rs4680; CYP1A2 \*1B, \*1C, \*1D, \*1E, \*1F, \*1K and \*11; CYP2B6 \*4, \*5, \*6 and \*9; CYP2C19 \*2, \*3, \*4, \*5, \*6, \*7, \*8, \*9, \*10, \*17, and \*35; CYP2C9 \*2, \*3, \*4, \*5, \*6, \*8, \*11, \*13, and \*27; CYP2D6 \*2, \*3, \*4, gene deletion (\*5), gene duplication, \*6, \*7, \*8, \*9, \*10, \*11, \*12, \*14, \*15, \*17, \*29 and \*41; CYP3A4 \*22; CYP3A5 \*3, \*6, \*7; DRD2 rs1799732; GRIK1 rs2832407; HLA-B\*15:02 presence and HLA-A\*31:01 presence detected by qPCR; HTR2A rs7997012; HTR2C rs3813929; MC4R rs489693; MTHFR rs1801131 and rs1801133; OPRM1 rs1799971; SLC6A4 rs25531 and rs63749047; SLC01B1\*5, UGT2B15 rs1902023; and UGT1A4 rs2011425. Other known variants that are not listed are not detected and will not be included in the test report.

Version 3.2 [4/24/2023]

#### **Literature References**

Summaries of references are available upon request of Genomind's comprehensive literature summary [April 2023 (V3.2)]. <a href="https://genomind.com/providers/genomind-pgx-literature-review/">https://genomind.com/providers/genomind-pgx-literature-review/</a>