



# SAMPLE REPORT

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Presented here are the results of the Coriell Life Sciences systematic review of available guidance and research literature. The CLS PGx Research Review is a general purpose research assistance service intended to provide users with relevant medical reference information related to identified gene variations and their drug associations. This research review reflects the professional opinions of the CLS research team, and are intended solely for general purpose research use and are not intended for use in clinical diagnosis or treatment. Independent review of the same evidence can be performed, with referenced sources documented at [coriell.com/refs](http://coriell.com/refs).

Patient: Eleven, Test  
 Date of Birth: Feb 03, 1970

Sample ID: PGX000107

## GeneDose LIVE Research Tool

Dive deeper into the research using the Coriell GeneDose LIVE research support tool via this secured URL: <http://checkdru.gs/>

**GeneDose Key: ADPPCHJKR**  
**Sample ID: PGX000107**

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### Genetic Research Summary Information

† Key: Indeterminant, Uncertain = No known diplotype or activity; Negative = wild type alleles; Positive = heterozygous or homozygous alleles; n/a = no gene information available.

## Genetic Research Summary

| Gene             | Diplotype | Activity † |
|------------------|-----------|------------|
| ABCB1(rs1045642) | G G       | Positive   |
| ABCB1(rs1128503) | G G       | Positive   |
| ABCB1(rs2032582) | C C       | Positive   |

| Gene               | Diplotype | Activity †                |
|--------------------|-----------|---------------------------|
| ABCG2              | G G       | Normal function           |
| ADRA2A(c.-1252G>C) | G G       | Negative                  |
| ANKK1              | A A       | Altered function          |
| ApoE               | E3 E3     | See ApoE Research Summary |
| ATM(C11orf65)      | C A       | Positive                  |
| COMT(Val158Met)    | G G       | Normal function           |
| CYP1A2             | *1L *1L   | Unknown Metabolizer       |
| CYP2B6             | *1 *5     | Normal metabolizer        |
| CYP2C19            | *1 *1     | Normal metabolizer        |
| CYP2C8             | *1 *1     | Normal metabolizer        |
| CYP2C9             | *1 *1     | Normal metabolizer        |
| CYP2D6             | *4A *10A  | Intermediate metabolizer  |
| CYP3A4             | *1A *1A   | Normal metabolizer        |
| CYP3A5             | *3 *6     | Poor metabolizer          |

| Gene             | Diplotype     | Activity †                      |
|------------------|---------------|---------------------------------|
| CYP4F2           | *1 *1         | Normal metabolizer              |
| DPYD             | *1 *1         | Normal metabolizer              |
| DRD2(-241A>G)    | T/T           | Negative                        |
| Factor V Leiden  | Normal        | See Thrombosis Research Summary |
| GRIK4            | T T           | Negative                        |
| HTR2A(rs7997012) | rs7997012 A/G | Positive                        |
| HTR2C(2565G>C)   | C/C           | Negative                        |
| HTR2C(-759C>T)   | C C           | Negative                        |
| MTHFR (A1298C)   | T T           | Normal function                 |
| MTHFR (C677T)    | G G           | Normal function                 |

| Gene             | Diplotype | Activity †                      |
|------------------|-----------|---------------------------------|
| NUDT15           | *1 *1     | Normal metabolizer              |
| OPRM1(A118G)     | A A       | Normal function                 |
| Prothrombin (F2) | Normal    | See Thrombosis Research Summary |
| SLCO1B1          | *1 *1     | Normal function                 |
| TPMT             | *1 *1     | Normal metabolizer              |
| UGT2B15          | *1 *2     | Decreased function              |
| VKORC1           | *1 *1     | Low sensitivity to warfarin     |

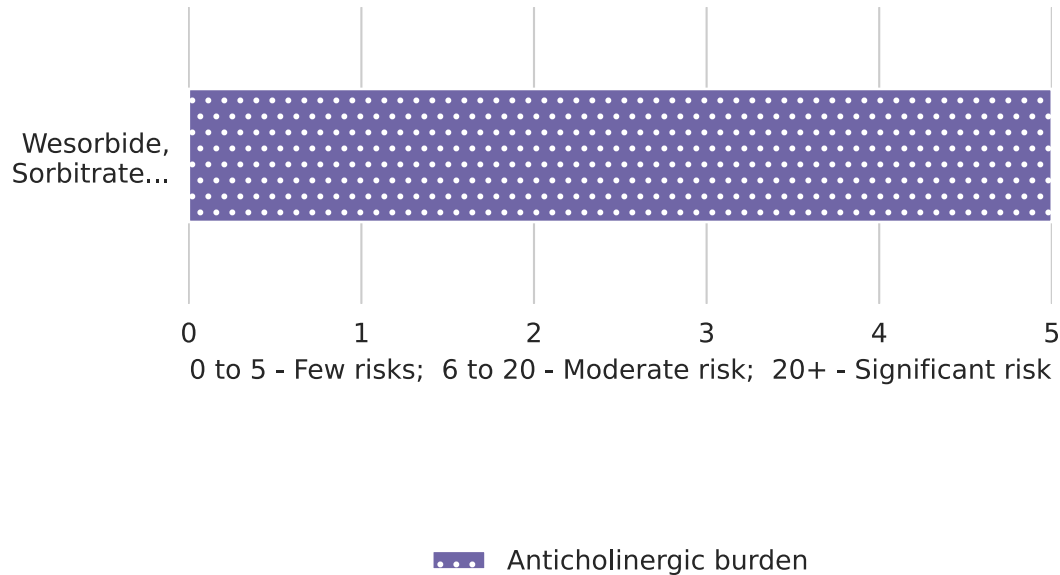
## PGX000107 - Eleven, Test - Reported Dec 28, 2023

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## Assessed Regimen Risk Summary

This chart summarizes additional risk factors associated with each medication for Test Eleven. The length of each colored segment represents the relative contribution of a risk category (detailed in the below legend) to the overall risk associated with the use of a medication. For further information, consult the [Current Regimen Risk Details Pg. 0](#) section.

For further assistance in choosing alternative medications to reduce this patient's risk, use the modeling tool at <http://checkdru.gs/>.



## Thrombosis Research Summary

| Tested Gene (Allele) | Diplotype Classification | Research Summary   |
|----------------------|--------------------------|--|
| Prothrombin (F2)     | Normal                   | Normal risk expected based on the patient's genotype. The absence of these variant alleles of Prothrombin (Factor II) and Factor V Leiden suggests that the patient does not have the elevated risk of thrombosis associated with these genetic markers. |
| Factor V Leiden      | Normal                   |  |
| MTHFR (A1298C)       | Normal                   |  |
| MTHFR (C677T)        | Normal                   |  |

### References

- Zhang S, et al.; ACMG Laboratory Quality Assurance Committee. Venous thromboembolism laboratory testing (factor V Leiden and factor II c.\*97G>A), 2018 update: a technical standard of the American College of Medical Genetics and Genomics (ACMG). Genet Med. 2018 Dec;20(12):1489-1498. doi: 10.1038/s41436-018-0322-z. Epub 2018 Oct 5. PMID: 30297698.
- Bhatt S, et al.; ACMG Professional Practice and Guidelines Committee. Addendum: American College of Medical Genetics consensus statement on factor V Leiden mutation testing. Genet Med. 2021 Mar 5. doi: 10.1038/s41436-021-01108-x. Epub ahead of print. PMID: 33674767.
- Lim MY, et al.; Thrombophilic risk of individuals with rare compound factor V Leiden and prothrombin G20210A polymorphisms: an international case series of 100 individuals. Eur J Haematol. 2016 Oct;97(4):353-60. doi: 10.1111/ejh.12738. Epub 2016 Feb 18. PMID: 26773706.
- Saemundsson Y, et al.; Homozygous factor V Leiden and double heterozygosity for factor V Leiden and prothrombin mutation. J Thromb Thrombolysis. 2013 Oct;36(3):324-31. doi: 10.1007/s11239-012-0824-5. PMID: 23054468.
- Stevens SM, et al.; Guidance for the evaluation and treatment of hereditary and acquired thrombophilia. J Thromb Thrombolysis. 2016 Jan;41(1):154-64. doi: 10.1007/s11239-015-1316-1. PMID: 26780744; PMCID: PMC4715840.

## ApoE Research Summary

| Tested Gene (Alleles) | Diplotype | Research Summary  |
|-----------------------|-----------|---|
| ApoE (ε2, ε3, ε4)     | ε3 ε3     | Two wild-type alleles.<br>Typical cardiovascular disease risk expected. |





## Medication Research Summary (more alternatives discoverable at GeneDose Live)





Secured URL: <https://app.genedose.com/?token=ADPPCHJKR>





| Therapeutic Class                       | Standard Precautions | Caution / Info | Change Indicated |
|---|----------------------|----------------|------------------|
| Adrenergic alpha-1 Receptor Antagonists |                      | Tamsulosin     |                  |
| Alpha-2-adrenergic                      | Clonidine            | Lofexidine     |                  |

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| Therapeutic Class             |  <b>Standard Precautions</b>   |   <b>Caution / Info</b> |  <b>Change Indicated</b> |
|-------------------------------|---|---|---|
| <b>agonists</b>               | Guanfacine  |   |   |
| <b>Analgesics, Opioid</b>     | Alfentanil<br>Buprenorphine<br>Fentanyl<br>Fentanyl (OPRM1)<br>Hydromorphone<br>Methadone (CYP2B6)<br>Morphine<br>Oxycodone<br>Oxycodone (CYP3A4)<br>Sufentanil | Codeine<br>Hydrocodone<br>Oliceridine<br>Oxycodone (CYP3A5)<br>Tramadol   |   |
| <b>Anti-angina medication</b> |   | Ranolazine  |   |
| <b>Antiarrhythmics</b>        |   | Flecainide<br>Propafenone   |   |
| <b>Anticholinergic Agents</b> |   | Fesoterodine<br>Tolterodine   |   |
| <b>Anticoagulants</b>         | Acenocoumarol<br>Warfarin (CYP2C9, CYP4F2, VKORC1)  |   |   |
| <b>Anticonvulsants</b>        | Brivaracetam<br>Clobazam<br>Phenytoin   |   |   |
| <b>Antiemetics</b>            |   | Meclizine<br>Ondansetron<br>Tropisetron   |   |
| <b>Antiestrogens</b>          |   |   | Tamoxifen   |
| <b>Antifungals</b>            | Flucytosine<br>Ketoconazole<br>Voriconazole   |   |   |
| <b>Antimetabolites</b>        | Capecitabine<br>Fluorouracil<br>Methotrexate  |   |   |

| Therapeutic Class                         |  <b>Standard Precautions</b> |   <b>Caution / Info</b> |  <b>Change Indicated</b> |
|---|---|---|---|
|   | Tegafur   |   |   |
| <b>Antiplatelet Agents</b>                | Clopidogrel<br>Prasugrel<br>Ticagrelor  |   |   |
| <b>Anxiolytics</b>                        | Buspirone   |   |   |
| <b>Atypical antipsychotics</b>            | Brexipiprazole<br>Olanzapine<br>Quetiapine  | Aripiprazole<br>Aripiprazole Lauroxil<br>Clozapine<br>Iloperidone<br>Risperidone<br>Sertindole  |   |
| <b>Benzodiazepines</b>                    | Alprazolam<br>Clonazepam<br>Diazepam  | Lorazepam<br>Oxazepam   |   |
| <b>Beta-3 Adrenergic Agonists</b>         | Mirabegron  |   |   |
| <b>Beta Blockers</b>                      | Nebivolol<br>Propranolol  | Carvedilol<br>Metoprolol<br>Timolol   |   |
| <b>Biguanides</b>                         |   | Metformin   |   |
| <b>Central Monoamine-Depleting Agents</b> |   | Tetrabenazine   |   |
| <b>Central Nervous System Agents</b>      |   | Dextromethorphan-<br>Quinidine  |   |
| <b>Cholinergic Agonists</b>               |   | Cevimeline  |   |
| <b>Cholinesterase Inhibitors</b>          | Galantamine   | Donepezil   |   |
| <b>CNS Stimulants</b>                     | Amphetamine<br>Dexmethylphenidate<br>Dextroamphetamine<br>Lisdexamfetamine                                    | Amphetamine<br>(CYP2D6)   |   |





| Therapeutic Class                                      |  <b>Standard Precautions</b> |   <b>Caution / Info</b> |  <b>Change Indicated</b> |
|--|---|---|---|
|  | Methylphenidate (ADRA2A)<br>Methylphenidate (COMT)  |   |   |
| <b>Contraceptives</b>                                  | Estrogen-containing oral contraceptives   |   |   |
| <b>Dipeptidyl peptidase-4 (DPP-4) inhibitor</b>        | Saxagliptin   |   |   |
| <b>EGFR Inhibitors</b>                                 |   | Gefitinib   |   |
| <b>Enzyme Inhibitors</b>                               |   | Eliglustat  |   |
| <b>H3 receptor antagonist</b>                          |   | Pitolisant  |   |
| <b>Hypnotics</b>                                       | Eszopiclone   |   |   |
| <b>Immunosuppressants</b>                              | Azathioprine<br>Azathioprine (NUDT15)<br>Cyclosporine<br>Sirolimus  | Tacrolimus  |   |
| <b>Monoamine Oxidase Inhibitors</b>                    | Moclobemide   |   |   |
| <b>Muscle Relaxants</b>                                | Carisoprodol  |   |   |
| <b>Non-nucleoside reverse transcriptase inhibitors</b> | Efavirenz<br>Nevirapine   |   |   |
| <b>Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)</b>   | Celecoxib<br>Diclofenac<br>Flurbiprofen<br>Ibuprofen<br>Lornoxicam<br>Meloxicam<br>Piroxicam                  |   |   |
| <b>Platinum-containing compounds</b>                   | Cisplatin   |   |   |

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| Therapeutic Class   | <b>Standard Precautions</b>  | <b>Caution / Info</b>   | <b>Change Indicated</b> |
|---|--|---|-------------------------|
| <b>Prokinetic agents</b>  |  | Metoclopramide  |                         |
| <b>Proton Pump Inhibitors (PPIs)</b>                                  | Esomeprazole<br>Rabeprazole  | Dexlansoprazole<br>Lansoprazole<br>Omeprazole<br>Pantoprazole |                         |
| <b>Purine analogs</b>   | Thioguanine<br>Thioguanine (NUDT15)  |   |                         |
| <b>Purine antagonists</b>   | Mercaptopurine<br>Mercaptopurine (NUDT15)  |   |                         |
| <b>Selective Serotonin Reuptake Inhibitors (SSRIs)</b>                | Citalopram<br>Escitalopram<br>Fluoxetine<br>Sertraline   | Dapoxetine<br>Fluvoxamine<br>Paroxetine<br>Vortioxetine       |                         |
| <b>Serotonin and Norepinephrine Reuptake Inhibitors (SSNRI)</b>       |  | Atomoxetine<br>Duloxetine                                     | Venlafaxine             |
| <b>Serotonin Receptor Antagonists and Reuptake Inhibitors (SARIs)</b> | Trazodone  |   |                         |
| <b>Skeletal muscle relaxant</b>                                       |  | Tolperisone   |                         |
| <b>Smoking Cessation</b>  |  | Bupropion   |                         |
| <b>Statins</b>  | Atorvastatin<br>Atorvastatin (SLCO1B1)<br>Fluvastatin (CYP2C9)<br>Fluvastatin (SLCO1B1, CYP2C9)<br>Lovastatin (SLCO1B1)<br>Pitavastatin (SLCO1B1)<br>Pravastatin (SLCO1B1)<br>Rosuvastatin |   |                         |

| Therapeutic Class                                  |  <b>Standard Precautions</b> |   <b>Caution / Info</b>  |  <b>Change Indicated</b> |
|--|---|--|---|
|  | (SLCO1B1, ABCG2)<br>Simvastatin   |  |   |
| <b>Sulfonylurea</b>                                | Gliclazide<br>Glimepiride<br>Glyburide<br>Tolbutamide   |  |   |
| <b>Tetracyclic antidepressants</b>                 | Mirtazapine   |  |   |
| <b>Tricyclic antidepressants</b>                   | Trimipramine (CYP2C19)  | Amitriptyline (CYP2C19, CYP2D6)<br>Amoxapine<br>Clomipramine (CYP2C19, CYP2D6)<br>Desipramine<br>Doxepin (CYP2C19, CYP2D6)<br>Imipramine (CYP2C19, CYP2D6)<br>Nortriptyline<br>Protriptyline<br>Trimipramine<br>Trimipramine (CYP2C19, CYP2D6) |   |
| <b>Typical antipsychotics</b>                      | Flupenthixol<br>Haloperidol   | Perphenazine<br>Pimozide<br>Zuclophenthixol  | Thioridazine  |
| <b>Vesicular monoamine transporter 2 inhibitor</b> |   | Deutetrabenazine<br>Valbenazine  |   |
| <b>Xanthine Oxidase Inhibitor</b>                  | Allopurinol   |  |   |

**Legend**

**Research Summary**





-  Typical response is expected
-  Consider alternative therapy
-  Change Indicated

-  Additional information available
-  Response is uncertain

**Evidence Level**

-  Strong
-  Moderate
-  Emerging









**Medication Research Details (by therapeutic class)**









| Drug  | Finding  | Research Summary  | Concern | Evidence   |
|---|--|---|---------|--|
| <b>Adrenergic alpha-1 Receptor Antagonists</b>          |  |   |         |  |
| <b>Tamsulosin</b><br>(Flomax)                           |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |   |
| <b>Alpha-2-adrenergic agonists</b>                      |  |   |         |  |
| <b>Lofexidine</b><br>(Kai Er Ding, Lucemyra, Britlofex) |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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   | Research Summary   | Concern  | Evidence |
|---------------------------------------|---|--|----------|----------|
| <b>Analgesics, Opioid</b>             |   |  |          |          |
| <b>Codeine</b>                        | CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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 |          |
| <b>Hydrocodone</b>                    | CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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 |          |
| <b>Oliceridine (Olinvyk)</b>          | CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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      |          |
| <b>Oxycodone (CYP3A5) (Oxycontin)</b> | CYP3A5: Poor metabolizer. Two little or no function alleles.  | 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 |          |
| <b>Tramadol (Ultracet, Ultram)</b>    | CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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 |          |
| <b>Anti-angina medication</b>         |   |  |          |          |
| <b>Ranolazine (Ranexa)</b>            | CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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      |          |

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| Drug                            | Finding   | Research Summary  | Concern | Evidence  |
|---------------------------------|---|---|---------|---|
| <b>Antiarrhythmics</b>          |   |   |         |   |
| <b>Flecainide</b><br>(Tambocor) |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Propafenone</b><br>(Rythmol) |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Anticholinergic Agents</b>   |   |   |         |   |
| <b>Fesoterodine</b><br>(Toviaz) |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Tolterodine</b><br>(Detrol)  |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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   | Research Summary  | Concern  | Evidence  |
|---|---|---|----------|---|
| <b>Antiemetics</b>                        |   |   |          |   |
| <b>Meclizine</b><br>(Bonine, Antivert)    |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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      |    |
| <b>Ondansetron</b><br>(Zofran)            |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | Intermediate metabolizers of this medication may present with higher plasma concentrations of the active medication. Monitor the patient's response to guide dosing.  | ADR      |    |
| <b>Tropisetron</b><br>(Navoban, Setrovel) |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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      |    |
| <b>Antiestrogens</b>                      |   |   |          |   |
| <b>Tamoxifen</b><br>(Soltamox, Nolvadex)  |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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 |  |

| Drug  | Finding   | Research Summary  | Concern | Evidence  |
|---|---|---|---------|---|
| <b>Atypical antipsychotics</b>                              |   |   |         |   |
| <b>Aripiprazole</b><br>(Abilify)                            |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Aripiprazole Lauroxil</b><br>(Aristada Initio, Aristada) |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Clozapine</b><br>(Clozaril, Leponex, Versacloz)          |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Iloperidone</b><br>(Fanapt)                              |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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     |  |
| <b>Risperidone</b><br>(Risperdal)                           |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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     |  |
| <b>Sertindole</b><br>(Serolect, Serlect)                    |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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     |  |

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| Drug                             | Finding  | Research Summary  | Concern  | Evidence  |
|----------------------------------|--|---|----------|---|
| <b>Benzodiazepines</b>           |  |   |          |   |
| <b>Lorazepam</b><br>(Ativan)     |  UGT2B15:<br>Decreased function.<br>One normal function allele and one decreased function allele.           | Individuals with decreased function of this gene 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      |    |
| <b>Oxazepam</b><br>(Aleepam)     |  UGT2B15:<br>Decreased function.<br>One normal function allele and one decreased function allele.           | Individuals with decreased function of this gene 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      |    |
| <b>Beta Blockers</b>             |  |   |          |   |
| <b>Carvedilol</b><br>(Coreg)     |  CYP2D6:<br>Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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      |    |
| <b>Metoprolol</b><br>(Lopressor) |  CYP2D6:<br>Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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      |   |
| <b>Timolol</b><br>(Blocadren)    |  CYP2D6:<br>Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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      |  |
| <b>Biguanides</b>                |  |   |          |   |
| <b>Metformin</b><br>(Glucophage) |  ATM(C11orf65): One wild type allele and one variant allele.  | Individuals with these heterozygous alleles frequently present with increased medication efficacy. No additional therapeutic recommendations.   | Efficacy |  |

PGX000107 - Eleven, Test - Reported Dec 28, 2023









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| Drug   | Finding   | Research Summary  | Concern | Evidence  |
|--|---|---|---------|---|
| <b>Central Monoamine-Depleting Agents</b>        |   |   |         |   |
| <b>Tetrabenazine</b><br>(Xenazine)               |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Central Nervous System Agents</b>             |   |   |         |   |
| <b>Dextromethorphan-Quinidine</b><br>(Nuedexta)  |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Cholinergic Agonists</b>                      |   |   |         |   |
| <b>Cevimeline</b><br>(Evoxac)                    |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Cholinesterase Inhibitors</b>                 |   |   |         |   |
| <b>Donepezil</b><br>(Aricept)                    |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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     |  |
| <b>CNS Stimulants</b>                            |   |   |         |   |
| <b>Amphetamine (CYP2D6)</b><br>(Adzenys, Evekeo) |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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     |  |









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| Drug                                    | Finding   | Research Summary  | Concern  | Evidence  |
|---|---|---|----------|---|
| <b>EGFR Inhibitors</b>                  |   |   |          |   |
| <b>Gefitinib</b><br>(Iressa)            |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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      |    |
| <b>Enzyme Inhibitors</b>                |   |   |          |   |
| <b>Eliglustat</b><br>(Cerdelga)         |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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      |    |
| <b>H3 receptor antagonist</b>           |   |   |          |   |
| <b>Pitolisant</b><br>(Wakix)            |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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      |    |
| <b>Immunosuppressants</b>               |   |   |          |   |
| <b>Tacrolimus</b><br>(Prograf, Hecoria) |  CYP3A5: Poor metabolizer. Two little or no function alleles.  | 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 |  |











| Drug             | Finding  | Research Summary                                     | Concern | Evidence |
|------------------|--|--|---------|----------|
| <b>Non-drug</b>  |  |  |         |          |
| ABCB1(rs1045642) |  ABCB1(rs1045642): Two variant alleles detected.  | No additional therapeutic recommendations.           |         |          |
| ABCB1(rs1128503) |  ABCB1(rs1128503): Two variant alleles detected.  | No additional therapeutic recommendations.           |         |          |
| ABCB1(rs2032582) |  ABCB1(rs2032582): Two variant alleles detected.  | No additional therapeutic recommendations.           |         |          |
| ANKK1            |  ANKK1: Altered function. Two altered function alleles.                                       | Altered function. Two alleles with altered activity. |         |          |
| ApoE             |  ApoE: Two wild-type alleles.   | Typical cardiovascular disease risk expected.        |         |          |
| CYP1A2           |  CYP1A2: Indeterminate metabolizer. Two uncertain function alleles.                           | No additional therapeutic recommendations.           |         |          |
| HTR2A            |  HTR2A(rs7997012): One wild type allele and one variant allele.                             | No additional therapeutic recommendations.           |         |          |
| HTR2A(rs7997012) |  HTR2A(rs7997012): One wild type allele and one variant allele.                             | No additional therapeutic recommendations.           |         |          |
| OPRM1(A118G)     |  OPRM1(A118G): Normal function. Two alleles with normal activity.                           | Normal function. Two alleles with normal activity.   |         |          |
| UGT2B15          |  UGT2B15: Decreased function. One normal function allele and one decreased function allele. | No additional therapeutic recommendations.           |         |          |

| Drug  | Finding   | Research Summary   | Concern  | Evidence |
|---|---|--|----------|----------|
| <b>Prokinetic agents</b>                      |   |  |          |          |
| <b>Metoclopramide</b><br>(Primperan, Reglan)  | CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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      |          |
| <b>Proton Pump Inhibitors (PPIs)</b>          |   |  |          |          |
| <b>Dexlansoprazole</b><br>(Dexilant, Kapidex) | CYP2C19: Normal metabolizer. Two normal function alleles.   | Normal metabolizers of this medication may present with lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Monitor the patient's response to guide dosing; consider increasing the dose. | Efficacy |          |
| <b>Lansoprazole</b><br>(Prevacid)             | CYP2C19: Normal metabolizer. Two normal function alleles.   | Normal metabolizers of this medication may present with lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Monitor the patient's response to guide dosing; consider increasing the dose. | Efficacy |          |
| <b>Omeprazole</b><br>(Prilosec, Zegerid)      | CYP2C19: Normal metabolizer. Two normal function alleles.   | Normal metabolizers of this medication may present with lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Monitor the patient's response to guide dosing; consider increasing the dose. | Efficacy |          |
| <b>Pantoprazole</b><br>(Protonix)             | CYP2C19: Normal metabolizer. Two normal function alleles.   | Normal metabolizers of this medication may present with lower plasma concentrations of the active medication, thus an increased risk of pharmacotherapy failure. Monitor the patient's response to guide dosing; consider increasing the dose. | Efficacy |          |













| Drug   | Finding  | Research Summary  | Concern | Evidence   |
|--|--|---|---------|--|
| <b>Selective Serotonin Reuptake Inhibitors (SSRIs)</b> |  |   |         |  |
| <b>Dapoxetine</b><br>(Priligy, EJ-30)                  |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |   |
| <b>Fluvoxamine</b><br>(Luvox)                          |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |   |
| <b>Paroxetine</b><br>(Paxil)                           |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |   |
| <b>Vortioxetine</b><br>(Trintellix)                    |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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     |  |

| Drug  | Finding   | Research Summary  | Concern        | Evidence  |
|---|---|---|----------------|---|
| <b>Serotonin and Norepinephrine Reuptake Inhibitors (SSNRI)</b> |   |   |                |   |
| <b>Atomoxetine</b><br>(Strattera)                               |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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            |    |
| <b>Duloxetine</b><br>(Cymbalta)                                 |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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            |    |
| <b>Venlafaxine</b><br>(Effexor)                                 |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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 |    |
| <b>Skeletal muscle relaxant</b>                                 |   |   |                |   |
| <b>Tolperisone</b><br>(Mydocalm)                                |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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            |  |
| <b>Smoking Cessation</b>  |   |   |                |   |
| <b>Bupropion</b><br>(Wellbutrin)                                |  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       |  |

| Drug  | Finding  | Research Summary  | Concern | Evidence  |
|---|--|---|---------|---|
| <b>Tricyclic antidepressants</b>                                    |  |   |         |   |
| <b>Amitriptyline</b><br>(CYP2C19, CYP2D6)<br>(Elavil)               |  Multigenic: CYP2D6, CYP2C19: Intermediate metabolizer. One decreased function allele and one little or no function allele.; Normal metabolizer. Two normal function alleles.   | 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     |    |
| <b>Amoxapine</b><br>(Asendin)                                       |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |    |
| <b>Clomipramine</b><br>(CYP2C19, CYP2D6)<br>(Anafranil, Clomicalm)  |  Multigenic: CYP2D6, CYP2C19: Intermediate metabolizer. One decreased function allele and one little or no function allele.; Normal metabolizer. Two normal function alleles.   | 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     |    |
| <b>Desipramine</b><br>(Norpramin)                                   |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |  |
| <b>Doxepin</b><br>(CYP2C19, CYP2D6)<br>(Quitaxon, Aponal, Sinequan) |  Multigenic: CYP2D6, CYP2C19: Intermediate metabolizer. One decreased function allele and one little or no function allele.; Normal metabolizer. Two normal function alleles. | 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  | Research Summary  | Concern | Evidence  |
|--|--|---|---------|---|
| <b>Imipramine (CYP2C19, CYP2D6)</b><br>(Tofranil-PM, Tofranil) |  Multigenic: CYP2D6, CYP2C19: Intermediate metabolizer. One decreased function allele and one little or no function allele.; Normal metabolizer. Two normal function alleles.   | 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     |    |
| <b>Nortriptyline (Pamelor)</b>                                 |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |    |
| <b>Protriptyline (Vivactil)</b>                                |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |    |
| <b>Trimipramine (Surmontil)</b>                                |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |  |
| <b>Trimipramine (CYP2C19, CYP2D6)</b><br>(Surmontil)           |  Multigenic: CYP2D6, CYP2C19: Intermediate metabolizer. One decreased function allele and one little or no function allele.; Normal metabolizer. Two normal function alleles. | 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   | Research Summary  | Concern | Evidence  |
|--|---|---|---------|---|
| <b>Typical antipsychotics</b>                      |   |   |         |   |
| <b>Perphenazine</b><br>(Trilafon)                  |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Pimozide</b><br>(Orap)                          |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Thioridazine</b><br>(Mellaril, Melleril)        |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.   | 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     |    |
| <b>Zuclopenthixol</b><br>(Cisordinol, Clopixol)    |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele.  | 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     |   |
| <b>Vesicular monoamine transporter 2 inhibitor</b> |   |   |         |   |
| <b>Deutetrabenazine</b><br>(Austedo)               |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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     |  |
| <b>Valbenazine</b><br>(Ingrezza)                   |  CYP2D6: Intermediate metabolizer. One decreased function allele and one little or no function allele. | 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     |  |

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## Evidence Levels

### Strong

- 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 Coriell Pharmacogenomics Advisory Group.
- Includes gene-drug pairs with guidelines supported by a pharmacogenomics consortium.

### 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 from regulatory agency-approved drug labels.
- Includes gene-drug pairs for which potential clinical outcomes are inferred from similar gene-drug interactions with guidelines supported by a pharmacogenomics consortium.

### Emerging

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

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## Patient Information Card

This card contains an abbreviated genetic research summary.  
It is not intended as a replacement for the complete CLS PGx Research Review.



**Coriell Life Sciences**  
[www.coriell.com/](http://www.coriell.com/)

**Patient:** **Eleven, Test**  
**DOB:** 1970-02-03  
**Sample ID:** PGX000107  
**GeneDose Key:** ADPPCHJKR

This card shows information about your genetics that relate to drug metabolism. Show to your doctors before being prescribed new medications. For additional support and guidance, physicians may visit <http://checkdru.gs/>.

### Genetic Research Summary

|                    |         |                           |
|--------------------|---------|---------------------------|
| ABCB1(rs1045642)   | G G     | Positive                  |
| ABCB1(rs1128503)   | G G     | Positive                  |
| ABCB1(rs2032582)   | C C     | Positive                  |
| ABCG2              | G G     | Normal function           |
| ADRA2A(c.-1252G>C) | G G     | Negative                  |
| ANKK1              | A A     | Altered function          |
| ApoE               | ε3 ε3   | See ApoE Research Summary |
| ATM(C11orf65)      | C A     | Positive                  |
| COMT(Val158Met)    | G G     | Normal function           |
| CYP1A2             | *1L *1L | Unknown Metabolizer       |
| CYP2B6             | *1 *5   | Normal metabolizer        |
| CYP2C19            | *1 *1   | Normal metabolizer        |

|                  |                  |                                 |
|------------------|------------------|---------------------------------|
| CYP2C8           | *1 *1            | Normal metabolizer              |
| CYP2C9           | *1 *1            | Normal metabolizer              |
| CYP2D6           | *4A *10A         | Intermediate metabolizer        |
| CYP3A4           | *1A *1A          | Normal metabolizer              |
| CYP3A5           | *3 *6            | Poor metabolizer                |
| CYP4F2           | *1 *1            | Normal metabolizer              |
| DPYD             | *1 *1            | Normal metabolizer              |
| DRD2(-241A>G)    | T T              | Negative                        |
| Factor V Leiden  | Normal           | See Thrombosis Research Summary |
| GRIK4            | T T              | Negative                        |
| HTR2A(rs7997012) | rs7997012<br>A/G | Positive                        |
| HTR2C(2565G>C)   | C/C              | Negative                        |
| HTR2C(-759C>T)   | C C              | Negative                        |
| MTHFR (A1298C)   | T T              | Normal function                 |
| MTHFR (C677T)    | G G              | Normal function                 |
| NUDT15           | *1 *1            | Normal metabolizer              |
| OPRM1(A118G)     | A A              | Normal function                 |
| Prothrombin (F2) | Normal           | See Thrombosis Research Summary |
| SLCO1B1          | *1 *1            | Normal function                 |
| TPMT             | *1 *1            | Normal metabolizer              |
| UGT2B15          | *1 *2            | Decreased function              |
| VKORC1           | *1 *1            | Low sensitivity to warfarin     |

↑ Cut on dotted lines.

↑ Fold Here

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**This report, associated with order #PGX000107, has been approved by the following reviewers:**

**Medical Director:**

Electronically signed and dated on 12.28.2023 17:10  
Tariq Adwan

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