

Introduction

Dante Labs Pharmacogenetics Report is for informational purposes only.

This report is NOT intended for US persons. This report was not submitted for approval to the US Food and Drug Administration (FDA).

The Pharmacogenetics Report analyzes a large amount of genomic data, associating genetic variants found in the genomic files with variants known from the scientific literature. While this Report does not require EMA approval, we do want to point out that it has not been reviewed or approved by the EMA for such use.

The genetic analysis and reporting are based on information from one or more published third party scientific and medical studies. We do not independently judge the validity or accuracy of such published scientific information.

Because scientific and medical information changes over time, your risk assessment and genetically tailored prevention for one or more of the medications contained within this report may also change over time.

Therefore, this report may not be 100% accurate (e.g., new research could mean different results) and may not predict actual results or outcomes. A person's risk of any particular phenotype, condition or trait is also based on other factors not yet analyzed in this report (e.g., diet, lifestyle, etc.).

This report may be updated from time to time so that the analysis and reporting incorporates new or changed research or scientific results. Because of this, the reports produced may change over time.

This genetic report should not be used in place of a visit with or advice from your doctor or other qualified healthcare professional. You should always get the advice of your doctor or other appropriate health care professional if you have any question about diagnosis, treatment, prevention, mitigation, or cure of any medical condition, phenotype, condition, impairment, or the status of your health. Do not stop any medications you have been prescribed, start any new medications, or modify any medical treatments ordered by your healthcare provider without first talking with your healthcare provider. If you have any healthcare related questions, please promptly consult your physician or other qualified healthcare provider.

Limitations and other important information

- This test provides genetic risk information based on assessment of specific genetic variants but does not report on your entire genetic profile. This test does not report all genetic variants related to a given disease or condition, and the absence of a variant tested does not rule out the presence of other genetic variants that may be related to the disease/condition.
- This test does not provide INDEL mutation analysis (INsertions/DEletions). Mutations analyzed include SNPs (Single Nucleotide Polymorphisms).
- Other genetic risk tests may report different genetic variants for the same disease/condition, so you may get different results using another genetic risk test.
- Other factors such as environmental and lifestyle risk factors may affect your risk of developing a given disease or health condition.
- This test is not a substitute for visits to your doctor or other health care professional. You should consult with your doctor or other health care professional if you have any questions or concerns about the results of your test or your current state of health.
- You may wish to speak to a genetic counselor, board-certified clinical molecular geneticist, or equivalent health care professional about the results of your test and to help answer any questions you may have. You can identify genetic counselors by visiting the National Society of Genetic Counselors website (<https://www.nsgc.org>).

- This test is not intended to diagnose any disease or condition, tell you anything about your current state of health, or be used to make medical decisions, including whether or not you should take a medication or how much of a medication you should take.
- The laboratory may not have been able to process your saliva sample. In this case Dante Labs will offer to send another kit to you to collect a second sample at no charge. If Dante Labs' attempts to process the second sample are unsuccessful, Dante Labs will not send additional sample collection kits and you or the person who paid for the Service (if that is not you) will be entitled to a complete refund of the amount paid to Dante Labs.
- For full Terms of Services, please visit: <https://www.dantelabs.com/pages/terms-of-service>
- This report has not been evaluated by the FDA. This product is not intended to diagnose, treat, cure, or prevent any disease

Information for health care professionals

- This test is not intended to diagnose a disease, determine medical treatment, or tell the user anything about their current state of health.
- This test is intended to provide users with their genetic information to inform lifestyle decisions and conversations with their doctor or other health care professional.
- Any diagnostic or treatment decisions should be based on testing and/or other information that you determine to be appropriate for your patient.

QUICK GUIDE

GASTROENTEROLOGY			
PROTON PUMP INHIBITORS (PPIS)	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Dexlansoprazole	CYP2C19	No variants detected so use the drug as directed	🟢
Lansoprazole	CYP2C19	No variants detected so use the drug as directed	🟢
Pantoprazole	CYP2C19	No variants detected so use the drug as directed	🟢
Omeprazole	CYP2C19	No variants detected so use the drug as directed	🟢
Esomeprazole	CYP2C19	No variants detected so use the drug as directed	🟢
Rabeprazole	CYP2C19	No variants detected so use the drug as directed	🟢
PAIN			
NONSTEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS)	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Nabumetone	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Tenoxicam	CYP2C9 *1/*2	Potentially toxicity	❌
Meloxicam	CYP2C9 *1/*2	Potentially toxicity	⚠️
Piroxicam	CYP2C9 *1/*2	Potentially toxicity	❌
Celecoxib	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Lumiracoxib	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Ketorolac	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Naproxen	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Metamizole	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Diclofenac	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Indomethacin	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Lornoxicam	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Flurbiprofen	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Aceclofenac	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
Ibuprofen	CYP2C9 *1/*2	No increased risk of adverse drug reaction	✅
SURGERY			
OPIOIDS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Fentanyl	OPRM1	No increased risk of adverse drug reaction	⚠️
Alfentanil	OPRM1	No increased risk of adverse drug reaction	⚠️
Remifentanil	OPRM1	No increased risk of adverse drug reaction	⚠️
Sufentanil	OPRM1	No increased risk of adverse drug reaction	⚠️
Morphine	OPRM1	No increased risk of adverse drug reaction	⚠️
DIABETOLOGY			
ANTIDIABETICS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Gliclazide	TCF7L2	Risk of therapeutic failure	⚠️
Glimepiride	TCF7L2	Risk of therapeutic failure	⚠️
Tolbutamide	TCF7L2	Risk of therapeutic failure	⚠️
Glyburide	TCF7L2	Risk of therapeutic failure	⚠️

CARDIAC			
ACE INHIBITORS ANTIHYPERTENSIVES	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Perindopril	KCNIP4	No increased risk of adverse drug reaction	✓
Benazepril	KCNIP4	No increased risk of adverse drug reaction	✓
Captopril	KCNIP4	No increased risk of adverse drug reaction	✓
Enalapril	KCNIP4	No increased risk of adverse drug reaction	✓
Fosinopril	KCNIP4	No increased risk of adverse drug reaction	✓
Lisinopril	KCNIP4	No increased risk of adverse drug reaction	✓
Quinapril	KCNIP4	No increased risk of adverse drug reaction	✓
Ramipril	KCNIP4	No increased risk of adverse drug reaction	✓
Trandolapril	KCNIP4	No increased risk of adverse drug reaction	✓

CARDIAC			
STATIN	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Rosuvastatin	ABCG2 SLCO1B1	No variants detected so use the drug as directed	🟢
Simvastatin	SLCO1B1	No variants detected so use the drug as directed	🟢
Lovastatin	SLCO1B1	No variants detected so use the drug as directed	🟢
Pitavastatin	SLCO1B1	No variants detected so use the drug as directed	🟢
Pravastatin	SLCO1B1	No variants detected so use the drug as directed	🟢
Atorvastatin	SLCO1B1	No variants detected so use the drug as directed	🟢
Fluvastatin	SLCO1B1	No variants detected so use the drug as directed	🟢
ANTICOAGULANTS			
ANTICOAGULANTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Aspirin Cardio 100/300, Aspirin, Aspirin-C	PTGS1	No variants detected so use the drug as directed	🟢
Warfarin	VKORC1 CYP2C9	Potentially toxicity	⚠️
ANTIPLATELET AGENTS			
ANTIPLATELET AGENTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Clopidogrel	CYP2C19	No variants detected so use the drug as directed	🟢
PSYCHOTROPIC			
ANTICONVULSANTS			
ANTICONVULSANTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Brivaracetam	CYP2C19	No variants detected so use the drug as directed	🟢
Carbamazepine	HLA-A	No variants detected so use the drug as directed	🟢
Oxcarbazine	HLA-B	No variants detected so use the drug as directed	🟢
ANTIDEMENTIA AGENTS			
ANTIDEMENTIA AGENTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Siponimod	CYP2C9 *1/*2	Potentially toxicity	⚠️
INFECTUS DISEASE			
ANTIFUNGALS			
ANTIFUNGALS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Voriconazole	CYP2C19	No variants detected so use the drug as directed	🟢
ANTI-RETROVIRAL AGENTS			
ANTI-RETROVIRAL AGENTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
PEG-interferon alpha/ Ribavirin, Telaprevir	IFNL3	No variants detected so use the drug as directed	🟢
Abacavir	HLA-B	No variants detected so use the drug as directed	🟢
ONCOLOGY			
ANTINEOPLASTIC AGENTS			
ANTINEOPLASTIC AGENTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Adalimumab	TNF-ALPHA	No variants detected so use the drug as directed	🟢
Certolizumab Pegol	TNF-ALPHA	No variants detected so use the drug as directed	🟢
Etanercept	TNF-ALPHA	No variants detected so use the drug as directed	🟢
Golimumab	TNF-ALPHA	No variants detected so use the drug as directed	🟢
Infliximab	TNF-ALPHA	No variants detected so use the drug as directed	🟢
Mercaptopurine	NUDT15 TPMT	No variants detected so use the drug as directed	🟢
Thioguanine	NUDT15 TPMT	No variants detected so use the drug as directed	🟢
Azathioprine	NUDT15 TPMT	No variants detected so use the drug as directed	🟢

GYNECOLOGY			
ENDOCRIN AGENTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Elagolix	SLC01B1 CYP2C19	No variants detected so use the drug as directed	🎯
Flibanserin	CYP2C19	No variants detected so use the drug as directed	🎯
PSYCHIATRY			
SELECTIVE SEROTONIN REUPTAKE INHIBITORS (SSRIS)	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Sertraline	CYP2C19	No variants detected so use the drug as directed	🎯
Escitalopram	CYP2C19	No variants detected so use the drug as directed	🎯

ANTIPSYCHOTICS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Aripiprazole	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Brexipiprazole	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Cariprazine	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Chlorpromazine	ANKK1 HTR2C	Potentially toxicity	⚠️
Flupentixol	ANKK1 HTR2C	Potentially toxicity	⚠️
Fluphenazine	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Loxapine	HTR2C	Potentially toxicity	⚠️
Lurasidone	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Methotrimeprazine	ANKK1 HTR2C	Potentially toxicity	⚠️
Paliperidone	MC4R	Potentially toxicity	⚠️
Perphenazine	ANKK1 HTR2C	Potentially toxicity	⚠️
Pipotiazine	ANKK1 HTR2C	Potentially toxicity	⚠️
Quetiapine	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Trifluoperazine	ANKK1 HTR2C	Potentially toxicity	⚠️
Ziprasidone	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Asenapin	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
clozapine	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Haloperidol	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Olanzapine	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️

ANTIPSYCHOTICS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Iloperidone	ANKK1 HTR2C MC4R	Potentially toxicity	⚠️
Risperidone	MC4R	Potentially toxicity	⚠️
Amisulpride	MC4R	Potentially toxicity	⚠️
ANXIOLYTICS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Clobazam	CYP2C19	No variants detected so use the drug as directed	🎯
Diazepam	CYP2C19	No variants detected so use the drug as directed	🎯
Alprazolam	CYP3A4	No increased risk of adverse drug reaction	✅
Bromazepam	CYP3A4	No increased risk of adverse drug reaction	✅
Triazolam	CYP3A4	No increased risk of adverse drug reaction	✅
Nitrazepam	CYP3A4	No increased risk of adverse drug reaction	✅
Lorazepam	UGT2B15	No variants detected so use the drug as directed	🎯
Oxazepam	UGT2B15	No variants detected so use the drug as directed	🎯
Temazepam	CYP3A4	No increased risk of adverse drug reaction	✅
OTHERS			
ANTIEMETICS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Dronabinol	CYP2C9 *1/*2	Potentially toxicity	⚠️
Ondansetron	ABCB1	No increased risk of adverse drug reaction	✅
IMMUNOSUPPRESSANTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Tacrolimus	CYP3A5 *1/*3	No increased risk of adverse drug reaction	⚠️
Cyclosporin	CYP3A5 *1/*3	No increased risk of adverse drug reaction	⚠️
MUSCLE RELAXANTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Carisoprodol	CYP2C19	No variants detected so use the drug as directed	🎯
BETA2 AGONIST AGENTS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Salmeterol	ADRB2	No variants detected so use the drug as directed	🎯
Perindopril	ADRB2	No variants detected so use the drug as directed	🎯
XANTHINE OXIDASE INHIBITORS	GENE(S) TESTED	IMPLICATIONS OF DRUG-GENE INTERACTION:	RESULTS
Allopurinol	HLA-B	No variants detected so use the drug as directed	🎯

KEY SUMMARY

The above Summary provides an overview of the predicted risks for the patient. This information is based solely on genotype information and does not replace a doctor visit or a complete patient profile. Additionally, healthcare providers should consider family history, presenting symptoms, current prescriptions, and other factors before making any clinical or therapeutic decisions.



No genetic variations with impact on the drug metabolism: patient's risk for the indicated condition is not increased.



Medication monitoring or dose adjustment is required because there are variants detected affecting drug metabolism.



This medication can be prescribed according to standard precautions because there are not variants detected affecting drug metabolism.



Higher risk of adverse drug reaction exist because there are variants detected affecting drug metabolism: guidelines exist for adjusting dosage or choose an alternative

DETAILED INFORMATION

 CELECOXIB
(CELEBREX®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Intermediate Metabolizers with an AS of 1.5 do not exhibit significant increases in drug exposure, despite having mildly reduced metabolism compared to NMs

Therapeutic Indications and Precautions for Use

- Symptomatic treatment of osteoarthritis
- Rheumatoid arthritis
- Ankylosing spondylitis

Taken with meals.

MELOXICAM (MOBIC®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers with an AS of 1.5 have higher plasma concentrations that may increase probability of toxicities

Therapeutic Indications and Precautions for Use

- Short-term symptomatic treatment of osteoarthritis exacerbations
- Long-term rheumatoid arthritis or ankylosing spondylitis

Taken with meals.

PIROXICAM (FELDENE®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher plasma concentrations

Therapeutic Indications and Precautions for Use

- Symptomatic treatment of osteoarthritis
- Rheumatoid arthritis
- Ankylosing spondylitis

Taken with meals.

✓ LUMIRACOXIB (PREXIGE®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher response to Lumiracoxib

Therapeutic Indications and Precautions for Use

- Osteoarthritis of the knee

May be taken with or without food.

✓ KETOROLAC (TORADOL®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher response to ketorolac

Therapeutic Indications and Precautions for Use

- Short-term (maximum 5 days) treatment of moderate to moderate postoperative pain intramuscularly or intravenously is indicated for the short-term (maximum two days) treatment of moderate-to-severe acute postoperative pain, injectable is also indicated In the treatment of pain due to renal colic, injectable is also indicated in the treatment of pain due to renal colic.

Take with meals to reduce gastrointestinal irritation

✓ NAPROXEN (NAPROXEN®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher response to Naproxen

Therapeutic Indications and Precautions for Use

- Short-term symptomatic treatment of osteoarthritis exacerbations
- Long-term rheumatoid arthritis or ankylosing spondylitis

Taken with meals.

✓ METAMIZOLE (NOVALGIN®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher response to Metamizole

Therapeutic Indications and Precautions for Use

- Severe or resistant painful
- Febrile states

DICLOFENAC (DICLOFENAC®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher response to diclofenac

Therapeutic Indications and Precautions for Use

- Inflammatory and degenerative rheumatic diseases such as (rheumatoid arthritis, ankylosing spondylitis, arthrosis, non-joint rheumatism)
- Painful states of inflammation of non-rheumatic origin or following a trauma
- Symptomatic treatment of primary dysmenorrhea
- Acute painful episodes in the course of inflammatory diseases of the musculoskeletal system and smooth muscle spasms

Avoid alcohol

INDOMETHACIN (INDOXEN®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher response to Indomethacin

Therapeutic Indications and Precautions for Use

- Inflammatory and non-inflammatory diseases of the musculoskeletal system: rheumatoid arthritis, arthrosis, gout.

Avoid alcohol

Take with meals to reduce gastric irritation

✓ ACECLOFENAC (ACECGEN®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher response to Aceclofenac

Therapeutic Indications and Precautions for Use

- Symptomatic treatment of pain and inflammation in osteoarthritis, rheumatoid arthritis and ankylosing spondylitis

✓ IBUPROFEN (ADVIL®, MOTRIN®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Intermediate Metabolizers with an AS of 1.5 do not exhibit significant increases in drug exposure, despite having mildly reduced metabolism compared to NMs

Therapeutic Indications and Precautions for Use

- Rheumatic diseases such as arthritic diseases (e.g. rheumatoid arthritis, including the juvenile form)
- Degenerative arthritic diseases (e.g. osteoarthritis)
- Extra-articular rheumatic diseases
- Other muscle and joint disorders soft tissue injuries

Avoid alcohol

Take with meals to reduce gastric irritation, food delays the time to reach plasma concentrations by 30-60 minutes and reduces plasma concentrations by 30-50%.

NABUMETONE (RELAFFEN®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher response to Nabumetone

Therapeutic Indications and Precautions for Use

- Osteoarthritis
- Rheumatoid arthritis requiring anti-inflammatory and analgesic treatment

The tablets are to be taken with or after food to minimise the risk of gastrointestinal adverse effects.

TENOXICAM (MOBIFLEX®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher plasma concentrations

Therapeutic Indications and Precautions for Use

- Symptomatic treatment of rheumatic
- Inflammatory and degenerative diseases

✓ FLURBIPROFEN (ANSAID®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Intermediate Metabolizers with an AS of 1.5 do not exhibit significant increases in drug exposure, despite having mildly reduced metabolism compared to NMs

Therapeutic Indications and Precautions for Use

- Anti-inflammatory
- Analgesic and antipyretic.

Avoid alcohol.

Take with meals to reduce gastric irritation.

✓ LORNOXICAM (XEFO®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Intermediate Metabolizers with an AS of 1.5 do not exhibit significant increases in drug exposure, despite having mildly reduced metabolism compared to NMs

Therapeutic Indications and Precautions for Use

- Treatment of moderate and severe pain
- Symptomatic of pain and inflammation associated with inflammatory or degenerative rheumatic diseases

FENTANYL (DURAGESIC®, SUBLIMAZE®)

Variant found:

- Gene related to drug metabolism: OPRM1
- SNP: rs1799971
- Position: 6:154360797
- Genotype: AG
- Predicted Phenotype: Reduced response (G allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the G allele have a reduced response to Fentanyl

Therapeutic Indications and Precautions for Use

- Indicated for short term analgesia during induction
- Maintenance, and recovery from general or regional anesthesia

The risk or severity of adverse effects can be increased when Fentanyl is combined with 1,2-Benzodiazepine.

ALFAFENTANIL (DSUVIA®, ALFENTA®)

Variant found:

- Gene related to drug metabolism: OPRM1
- SNP: rs1799971
- Position: 6:154360797
- Genotype: AG
- Predicted Phenotype: Reduced response (G allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the G allele have a reduced response to Alfentanil

Therapeutic Indications and Precautions for Use

- Indicated for short term analgesia during induction
- Maintenance, and recovery from general or regional anesthesia

The risk or severity of adverse effects can be increased when Fentanyl is combined with 1,2-Benzodiazepine.

REMIFENTANIL (DSUVIA®, ULTIVA®)

Variant found:

- Gene related to drug metabolism: OPRM1
- SNP: rs1799971
- Position: 6:154360797
- Genotype: AG
- Predicted Phenotype: Reduced response (G allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the G allele have a reduced response to Remifentanil

Therapeutic Indications and Precautions for Use

- Analgesic agent for use during the induction and maintenance of general anesthesia for inpatient and outpatient procedures.
- For continuation as an analgesic into the immediate postoperative period in adult patients under the direct supervision of an anesthesia practitioner in a postoperative anesthesia care unit or intensive care setting
- As an analgesic component of monitored anesthesia care in adult patients.

Due to additive pharmacologic effect, the concomitant use of benzodiazepines or other CNS depressants including alcohol, increases the risk of hypotension, respiratory depression, profound sedation, coma, and death.

SUFENTANIL (DSUVIA®, SUFENTA®)

Variant found:

- Gene related to drug metabolism: OPRM1
- SNP: rs1799971
- Position: 6:154360797
- Genotype: AG
- Predicted Phenotype: Reduced response (G allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the G allele have a reduced response to Sufentanil

Therapeutic Indications and Precautions for Use

- Indicated for short term analgesia during induction
- Maintenance, and recovery from general or regional anesthesia

The risk or severity of adverse effects can be increased when Fentanyl is combined with 1,2-Benzodiazepine.

MORPHINE (KADIAN®, MS CONTIN®)

Variant found:

- Gene related to drug metabolism: OPRM1
- SNP: rs1799971
- Position: 6:154360797
- Genotype: AG
- Predicted Phenotype: Reduced response (G allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the G allele have a reduced response to Morphine

Therapeutic Indications and Precautions for Use

- Cough suppressant

The concomitant intake of alcohol can increase the depressive effects on the CNS.

GLICLAZIDE (DIAMICRON®)

Variant found:

- Gene related to drug metabolism: TCF7L2
- SNP: rs7903146
- Position: 10:114758349
- Genotype: CT
- Predicted Phenotype: Reduced response (T allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying T allele have altered therapeutic response to SUs

Therapeutic Indications and Precautions for Use

- Indicated for the treatment of type 2 diabetes mellitus.

Avoid alcohol

A consistent diet is recommended to reduce the risk of hypoglycemia

Taken with meals

GLIMEPIRIDE (AMARYL®)

Variant found:

- Gene related to drug metabolism: TCF7L2
- SNP: rs7903146
- Position: 10:114758349
- Genotype: CT
- Predicted Phenotype: Reduced response (T allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying T allele have altered therapeutic response to SUs

Therapeutic Indications and Precautions for Use

- Indicated for the treatment of type 2 diabetes mellitus

Avoid alcohol.

Even if food reduces the absorption of the product, the manufacturer recommends taking the product with the first meal of the day.

TOLBUTAMIDE (ORINASE®)

Variant found:

- Gene related to drug metabolism: TCF7L2
- SNP: rs7903146
- Position: 10:114758349
- Genotype: CT
- Predicted Phenotype: Reduced response (T allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying T allele have altered therapeutic response to SUs

Therapeutic Indications and Precautions for Use

- Tolbutamide is an oral antihyperglycemic agent used for the treatment of non-insulin-dependent diabetes mellitus (NIDDM)

Sulfonylureas are associated with weight gain, though less so than insulin. Due to their mechanism of action, sulfonylureas may cause hypoglycemia and require consistent food intake to decrease this risk.



GLYBURIDE (DIABETA®, MICRONASE®)

Variant found:

- Gene related to drug metabolism: TCF7L2
- SNP: rs7903146
- Position: 10:114758349
- Genotype: CT
- Predicted Phenotype: Reduced response (T allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying T allele have altered therapeutic response to SUs

Therapeutic Indications and Precautions for Use

- Non-juvenile, non-acidotic diabetes mellitus in stenic-adipose subjects

Avoid alcohol.

Take 30-60 minutes before breakfast.



PERINDOPRIL (COVERSYL®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Hypertension
- Stable coronary artery disease

It's best taken at bedtime

✓ BENAZEPRIL (CIBACEN®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of high blood pressure (hypertension)
- Treatment of congestive heart failure
- Chronic renal failure

It's best taken at bedtime

✓ CAPTOPRIL (CAPOTEN®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of hypertension
- Heart failure
- MI
- Diabetic nephropathy type I.

Decreases potassium excretion, potassium-containing salt substitutes increase risk of hyperkalaemia.

High salt intake may attenuate the antihypertensive effect of captopril, food reduces absorption by 25-40% and herbs that can mitigate the antihypertensive effect of captopril include: bayberry, blue hat, cayenne, ephedra, ginger, ginseng (American), kola and licorice.



ENALAPRIL
(VASOTEC®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of hypertension
- Prevention and treatment of symptomatic heart failure

Decreases potassium excretion, potassium-containing salt substitutes increase risk of hyperkalaemia.

High salt intake may attenuate the antihypertensive effect of enalapril and herbs that can mitigate the antihypertensive effect of enalapril include: bayberry, blue hat, cayenne, ephedra, ginger, ginseng (American), kola and licorice.

 **FOSINOPRIL**
(MONOPRIL®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of hypertension
- Symptomatic heart failure

Do not take calcium, aluminum, magnesium, iron, or antacid supplements within 2 hours of taking this drug.

Decreases potassium excretion, potassium-containing salt substitutes increase risk of hyperkalaemia.

High salt intake may attenuate the antihypertensive effect of fosinopril and herbs that can mitigate the antihypertensive effect of fosinopril include: bayberry, blue hat, cayenne, ephedra, ginger, ginseng (American), kola and licorice

Taken with meals.



LISINAPRIL
(CARACE®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Hypertension
- Heart failure
- Acute myocardial infarction
- Renal complications of diabetes mellitus

Decreases potassium excretion, potassium-containing salt substitutes increase risk of hyperkalaemia.

High salt intake may attenuate the antihypertensive effect of lisinapril and herbs that can mitigate the antihypertensive effect of lisinapril include: bayberry, blue hat, cayenne, ephedra, ginger, ginseng (American), kola, and licorice

Taken with meals.

✓ QUINAPRIL (ACCUPRIL®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of essential hypertension
- Treatment of congestive heart failure

Do not take with a high-fat meal.

Decreases potassium excretion, potassium-containing salt substitutes increase risk of hyperkalaemia.

High salt intake may attenuate the antihypertensive effect of quinapril and herbs that can mitigate the antihypertensive effect of quinapril include: bayberry, blue hat, cayenne, ephedra, ginger, ginseng (American), kola and licorice.

✓ RAMIPRIL (ALTACE®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of hypertension
- Renal disease (incipient diabetic glomerular nephropathy, defined by the presence of microalbuminuria, manifest diabetic nephropathy, defined by the presence of macroproteinuria, in patients with at least one cardiovascular risk factor, manifest non-diabetic glomerular nephropathy, defined by the presence of macroproteinuria ≥ 3 g / day)

Alcohol can increase the vasodilating effects of ramipril.

 **TRANDOLAPRIL**
(MAVIK®)

Variant found:

- Gene related to drug metabolism: KCNIP4
- SNP: rs1495509
- Position: 4 : 21393616
- Genotype: CT
- Predicted Phenotype: Increased risk of adverse drug reactions (C allele HTZ)

Implications of Drug-Gene interaction:

Individuals carrying the C allele have an higher risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of symptomatic heart failure
- Secondary prevention after acute myocardial infarction: reduction of mortality from the acute phase of a myocardial infarction in patients with clinical signs of heart failure, when administered starting more than 48 hours after acute myocardial infarction

Herbs that can mitigate the antihypertensive effect of ramipril include: bayberry, blue coas, cayenne, ephedra, ginger, ginseng (American), kola and licorice.

WARFARIN (COUMADIN®, JANTOVEN®)

Variant found:

- Gene related to drug metabolism: VKORC1
- SNP: rs9923231
- Position: 16:31107689
- Genotype: TT

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Implications of Drug-Gene interaction:

Individuals with Intermediate phenotype for VKORC1/CYP2C9 have higher plasma concentrations:dose reduction required for greater risk of bleeding during warfarin therapy

Therapeutic Indications and Precautions for Use

- Prophylaxis of systemic embolisation in patients with rheumatic heart disease and atrial fibrillation
- Prophylaxis after insertion of prosthetic heart valves
- Prophylaxis and treatment of venous thrombosis and pulmonary embolism and transient cerebral ischaemic attacks

Avoid alcohol.

Contraindicated drugs: drugs used in the treatment or prophylaxis, drugs with adverse effects on haemostasis

SIPONIMOD (MAYZENT®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP2C9 Intermediate Metabolizers may have higher plasma concentrations

Therapeutic Indications and Precautions for Use

- Treatment of multiple sclerosis

Tablets can be taken with or without food.

TACROLIMUS (PROGRAF®)

Variant found:

- Gene related to drug metabolism: CYP3A5
- SNP: rs776746
- Position: 7:99270539
- Genotype: *1/*3
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals IM status have lower probability of achieving target concentrations and may result in higher rejection risk

Therapeutic Indications and Precautions for Use

- Prophylaxis of transplant rejection in patients receiving allogeneic liver
- Kidney or heart transplantation

Always take at the same time and in the same way (with or without meals) considering that mealtime affects the bioavailability of tacrolimus.

CYCLOSPORIN (GENGRAF®, NEORAL®, SANDIMMUNE®)

Variant found:

- Gene related to drug metabolism: CYP3A5
- SNP: rs776746
- Position: 7:99270539
- Genotype: *1/*3
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals IM status will require a lower dose of Cyclosporin to reach target levels

Therapeutic Indications and Precautions for Use

- Treatment of allogeneic transplant rejection resistant to treatment with other immunosuppressive medicinal products.

Taking it together with a meal rich in fat reduces the speed and extent of absorption.

DRONABINOL (MARINOL®, SYNDROS®)

Variant found:

- Gene related to drug metabolism: CYP2C9
- SNP: rs1799853
- Position: 10:96702047
- Genotype: *1/*2
- Predicted Phenotype: Intermediate Metabolizer

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

CYP2C9 Intermediate Metabolizers may have higher plasma concentrations

Therapeutic Indications and Precautions for Use

- Treatment of central
- Peripheral neuropathic pain

 **CITALOPRAM**
(CELEXA®)

Variant found:

- Gene related to drug metabolism: FKBP5
- SNP: rs4713916
- Position: 6:35669983
- Genotype: AG
- Predicted Phenotype: Increased response (G allele HTZ)

Implications of Drug-Gene interaction:

Variant found:

- Gene related to drug metabolism: GRIK4
- SNP: rs1954787
- Position: 11:120663363
- Genotype: TC
- Predicted Phenotype: Reduced response (T allele HTZ)

Implications of Drug-Gene interaction:

Variant found:

- Gene related to drug metabolism: HTR2A
- SNP: rs7997012
- Position: 13:47411985
- Genotype: GA
- Predicted Phenotype: Increased response (A allele HTZ)

Implications of Drug-Gene interaction:

Therapeutic Indications and Precautions for Use

- Endogenous depressive syndromes and prevention of relapses and recurrences
- Anxiety disorders with panic attacks, with or without agoraphobia.

Avoid alcohol and avoid taking foods and drinks (herbal teas) containing St. John's wort (Hypericum).
Taken with meals.

ALPRAZOLAM (XANAX®)

Variant found:

- Gene related to drug metabolism: CYP3A4
- SNP: rs2740574
- Position: 7:99382096
- Genotype: TT
- Predicted Phenotype: Increased Enzymatic Activity

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP3A4 Fast Metabolizers may have decreased plasma levels , especially if smoking.

Therapeutic Indications and Precautions for Use

- Anxiety
- Tension and other somatic or psychiatric manifestations associated with anxiety syndrome.

BROMAZEPAM (LEXOTAN®)

Variant found:

- Gene related to drug metabolism: CYP3A4
- SNP: rs2740574
- Position: 7:99382096
- Genotype: TT
- Predicted Phenotype: Increased Enzymatic Activity

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP3A4 Fast Metabolizers may have decreased plasma levels , especially if smoking.

Therapeutic Indications and Precautions for Use

- Anxiety
- Tension and other somatic or psychiatric manifestations associated with anxiety syndrome
- Insomnia

✓ TRIAZOLAM (HALCION®)

Variant found:

- Gene related to drug metabolism: CYP3A4
- SNP: rs2740574
- Position: 7:99382096
- Genotype: TT
- Predicted Phenotype: Increased Enzymatic Activity

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP3A4 Fast Metabolizers may have decreased plasma levels , especially if smoking.

Therapeutic Indications and Precautions for Use

- Short-term treatment of insomnia

✓ NITRAZEPAM (MOGADON®)

Variant found:

- Gene related to drug metabolism: CYP3A4
- SNP: rs2740574
- Position: 7:99382096
- Genotype: TT
- Predicted Phenotype: Increased Enzymatic Activity

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP3A4 Fast Metabolizers may have decreased plasma levels , especially if smoking.

Therapeutic Indications and Precautions for Use

- Short-term treatment of insomnia

Take with meals.
Avoid alcohol

✓ TEMAZEPAM (RESTORIL®)

Variant found:

- Gene related to drug metabolism: CYP3A4
- SNP: rs2740574
- Position: 7:99382096
- Genotype: TT
- Predicted Phenotype: Increased Enzymatic Activity

Ultra Rapid Metabolizer 

Rapid Metabolizer 

Intermediate Metabolizer 

Poor Metabolizer 

Implications of Drug-Gene interaction:

Individuals CYP3A4 Fast Metabolizers may have decreased plasma levels , especially if smoking.

Therapeutic Indications and Precautions for Use

- Short-term treatment of insomnia

Avoid alcohol and avoid excessive caffeine intake.
Taken with meals.

✓ RISPERIDONE (RISPERDAL®)

Variant found:

- Gene related to drug metabolism: DRD2
- SNP: rs1799978
- Position: 11:113346351
- Genotype: TC
- Predicted Phenotype: Typical response

Implications of Drug-Gene interaction:

Individuals carrying two copies of the C allele have a reduced response

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia
- Moderate to severe manic episodes associated with bipolar disorder
- Short-term persistent aggression in patients with moderate to severe Alzheimer's dementia who are unresponsive to non-pharmacological approaches and when there is a risk of harm to oneself or to others
- Symptomatic short-term treatment of persistent aggression in conduct disorder in children from the age of 5 and adolescents with below-average intellectual functioning or with mental retardation

PERPHENAZINE (ETRAFON®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia

Avoid alcohol, it can induce sedation and drowsiness.

FLUPETIXOL (DEPIXOL®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia and depression.

Take with meals



CHLORPROMAZINE (THORAZINE®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Schizophrenias
- Paranoid states
- Mania
- Toxic psychosis (amphetamines, LSD, cocaine, etc.)
- Organic mental syndromes accompanied by delirium
- Anxiety disorders if particularly severe and resistant to therapy with typical anxiolytics
- Depression when accompanied by agitation and delirium, mostly in association with antidepressants
- Incoercible vomiting and hiccups
- Treatment of severe pain usually in combination with narcotic analgesics, pre-anesthetic medication.

Avoid alcohol.

METHOTRIMEPRAZINE (NOZINAN®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenias
- Paranoid states and mania
- Toxic psychoses (amphetamines, LSD, cocaine etc.)
- Organic mental syndromes accompanied by delirium
- Vomiting and incoercible hiccups and treatment of intense pain generally in association with narcotic analgesics

TRIFLUOPERAZINE (STELAZINE®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of the manifestations of psychotic disorders
- For the control of the states of anxiety, tension and agitation that are observed in neuroses or associated with somatizations

 **PIPOTIAZINE**
(PIPORTIL®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Schizophrenia

Avoid alcohol

ARIPIPRAZOLE (ABILIFY®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia in adults and adolescents from 15 years of age
- Treatment of moderate to severe manic episodes in Bipolar I disorder
- Prevention of a new manic episode in adults who have had predominantly manic episodes that responded to aripiprazole treatment.

Avoid alcohol (Possible additive effect to the CNS).

Taken with meals.

BREXPIRAZOLE (REXULTI®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia in adult patients

It can be taken with or without food.

Brexpiprazole mildly to moderately affects the ability to drive and use machines due to potential nervous system effects, such as sedation and dizziness which are common adverse drug reactions.

CARIPRAZINE (VRAYLAR®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia in adult patients

Taken with meals, avoid alcohol.

Cariprazine has mild or moderate effects on the ability to drive and use machines, patients should be advised to exercise caution when using hazardous machinery, including motor vehicles.

FLUPHENAZINE (PROLIXIN®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Management of manifestations of psychotic disorders
- Management of behavioral complications in patients with mental retardation

LURASIDONE (LATUDA®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia in adults aged 18 years and over

The tablets are to be taken with food.

QUETIAPINE (SEROQUEL®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia
- Treatment of bipolar disorder (moderate to severe manic episodes, major depressive episodes)
- Prevention of recurrence of manic or depressive episodes in patients with bipolar disorder who have previously responded to quetiapine treatment

Avoid alcohol.

Taken with meals.

ZIPRASIDONE (GEODON®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Schizophrenia
- Bipolar disorder

Avoid alcohol

ASENAPIN (SAPHRIS®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of moderate to severe manic episodes associated with bipolar-type disorder in adults

Avoid water and food for at least 10 minutes after administration

CLOZAPINE (CLOZARIL®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment-resistant schizophrenia
- Psychosis in Parkinson's disease

Avoid alcohol and limit caffeine intake (may reduce clozapine metabolism).

HALOPERIDOL (HALDOL®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Psychomotor agitation (manic states, dementia, oligophrenia, psychopathy, acute and chronic schizophrenia, alcoholism, compulsive, paranoid, histrionic personality disorders)
- Delusions and hallucinations (acute and chronic schizophrenia, paranoia, acute mental confusion, alcoholism - Syndrome of Korsakoff, hypochondriasis, personality disorders of the paranoid, schizoid, schizotypic, antisocial type, some cases of the borderline type)
- Chorei-form movements
- Agitation
- Aggression and escape reactions in elderly subjects
- Tics and stuttering
- Vomiting
- Hiccups
- Withdrawal syndromes from alcohol.

Avoid alcohol and avoid excessive amounts of coffee or tea (caffeine).
Take with meals to reduce irritation.

OLANZAPINE (ZYDIS®, ZYPREXA®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Treatment of schizophrenia
- Treatment of moderate to severe manic episode

Avoid alcohol.

Taken with meals.

ILOPERIDONE (FANAPT®)

Variant found:

- Gene related to drug metabolism: ANKK1
- SNP: rs1800497
- Position: 11:113270828
- Genotype: AG
- Predicted Phenotype: Increased risk of ADR

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Variant found:

- Gene related to drug metabolism: MC4R
- SNP: rs489693
- Position: 18:57882787
- Genotype: CA
- Phenotype: Typical risk of adverse drug reactions

Implications of Drug-Gene interaction:

Individuals carrying the A allele have an increased risk of ADR

Therapeutic Indications and Precautions for Use

- Schizophrenia

Avoid alcohol

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GLOSSARY

ALLELE	An allele is a variant form of a gene that is located at a specific position (or genetic locus) on a specific chromosome. Humans have two alleles at each genetic locus, with one allele inherited from each parent.
CHROMOSOME	A chromosome is a condensed thread-like structure of DNA that carries hereditary information, or genes. Human cells have 22 chromosome pairs plus two sex chromosomes with a total of 46 per cell.
GENOME	A genome is an organisms' complete set of DNA, including all of its genes. Each genome contains all the information needed to build and maintain that organism. In humans, a copy of the entire genome—more than 3 billion DNA base pairs—is contained in all cells that have a nucleus.
GENOTYPE	A genotype is the genetic makeup of an individual organism. It may also refer to just a particular gene or set of genes carried by an individual. The genotype determines the phenotype, or observable traits of the organism.
METABOLIZER	When discussing PGx, we classify a person according to his/her phenotype (their metabolic capacity for a given enzyme). A poor metabolizer (PM) is a person who lacks a fully-functional enzyme or has reduced expression of the enzyme and therefore exhibits decreased metabolism of drugs. This person would require lower doses of a drug that is metabolized by that enzyme. A PM who receives a standard dose is more likely to experience unwanted side effects or toxicity. A PM can also experience diminished effects with drugs that need to be metabolized to active compounds by the enzyme in question. An intermediate metabolizer (IM) has one wild-type (normal) copy of the gene and one absent or dysfunctional copy. The IM group is very heterogeneous. A person with normal enzyme activity is referred to as wild type or as a rapid metabolizer (RM). This person should respond to standard dosages of a drug. Most people are RMs. This is the population in which most dosing regimens have been worked out in clinical trials. An ultrarapid metabolizer (UM) will require a higher dose than usual since he/she has a polymorphism (mutation) that codes for a more efficient enzyme or more expression of an enzyme. They will eliminate the drug more quickly. A UM may be resistant to standard treatments, and it may take some time to adjust the dosage before therapy is achieved.
DIPLTYPE	The two alleles inherited by an individual for a particular gene. Includes one maternal and one paternal allele that are both important to evaluate to predict phenotype.
PHENOTYPE	Phenotype is a description of an individuals' physical characteristics, including appearance, development and behavior. The phenotype is determined by the individual's genotype as well as environmental factors.
SNP	Single nucleotide polymorphisms, frequently called SNPs, are the most common type of genetic variation among people. A SNP is a variation in a single nucleotide that occurs at a specific position in the genome.
STAR NOMENCLATURE	The PGx nomenclature system groups haplotypes and subvariants (suballeles) based on the presence of amino acid changes and/or functional non-coding

[REDACTED] sequence variation and/or CNVs and structural variants using star (*) designations to facilitate phenotype prediction and clinical implementation.