EXAMPLE REPORT · COMPLETE REPORT FOR YOUR DOCTOR OR PHARMACIST

Full Report

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Report version	Created	Data source	Genome build
4.6	**Nov 8, 2026**	**WGS**	**GRCh38**

120 medications · 30 genes · 26 drug classes

This complete edition includes every gene result and every medication in this report tier, including results labeled “Use as directed,” all source guidance, evidence levels and limitations.

This is not a clinical test. Results are predictions from consumer DNA data and published research. The quality of submitted data is not independently verified and errors can affect the report. Do not change a dose or stop a medication without talking to your prescriber. Confirm any result that matters with a clinical-grade test.

Coverage depends on your data and report tier. A medication missing from this report may still have guidance from a clinical guideline or product label.

Reading the guidance

CONSIDER ALTERNATIVE 18 · USE WITH CAUTION 35 · USE AS DIRECTED 57 · NO KNOWN RISK VARIANTS FOUND 7 · UNABLE TO DETERMINE 3

Use as directed: no change suggested by the assessed genetic findings. Use with caution: a dose change, slower titration or monitoring may be suggested. Consider alternative: discuss another medication or the source’s dose advice. Unable to determine: the available data could not establish a result. No known risk variants found: a WGS screen of RYR1 and CACNA1S found no CPIC-listed malignant hyperthermia variant (CPIC: uncertain susceptibility); this does not exclude MH susceptibility. These labels do not guarantee effectiveness or freedom from side effects.

No known anesthesia risk variant was found. No CPIC-listed malignant-hyperthermia-associated variant was detected in the supplied WGS data. Susceptibility remains uncertain: this targeted screen cannot rule out malignant hyperthermia, and coverage at sites absent from your file could not be verified.

▼ **Screening details**

RYR1: No known risk variants found

Coverage at absent sites is unverified; absent records are not reference calls.

CACNA1S: No known risk variants found

Coverage at absent sites is unverified; absent records are not reference calls.

What the screen checks, for your anesthesia team

CPIC guideline

Report contents

Gene results at a glance · Complete medication guidance · Gene details and frequencies · About this report

Antidepressants	14 medications	Antipsychotics	12 medications
Psychostimulants	2 medications	Movement disorders	3 medications
Anticonvulsants	4 medications	Pain management	13 medications
Cardiovascular	7 medications	Cholesterol medications	7 medications
Antiemetics	4 medications	Proton pump inhibitors	4 medications
Oncology	13 medications	Immunosuppressants	4 medications
Antivirals	5 medications	Antifungals	1 medication
Anesthetics	8 medications	Weight management	3 medications
Antidiabetics	1 medication	Antihistamines	1 medication
Drugs used in addictive disorders	1 medication	Female sexual health	1 medication
Gaucher's disease treatments	1 medication	Gout	1 medication
Hair loss	1 medication	Saliva production stimulators	1 medication
Urologicals	1 medication	Other substances	7 medications

Your genes at a glance

All 30 results. Evidence and actionability differ by gene and medication. An activity score adds the activity values of your gene copies; higher scores indicate more enzyme activity. The detailed gene section explains each result.

GENE	YOUR TWO COPIES	GENOTYPE	PHENOTYPE	ACTIVITY SCORE
ABCG2		rs2231142G/rs2231142G	Normal Function	-
ADH1B		rs1229984C/rs1229984C	Normal Function	-
AKT1	T T	rs2494732T/rs2494732T	Normal Function	-
ALDH2		rs671G/rs671G	Normal Function	-
BCHE		Reference/Reference	Normal Metabolizer	-
CACNA1S		Reference/Reference	No known risk variants found	-
CHRNA5	G G	rs16969968G/rs16969968G	Normal Function	-
COMT		rs4680A/rs4680A	Decreased Function	-
CYP1A2		*1/*1	Normal Metabolizer	-
CYP2A6		*1/*17	Intermediate Metabolizer	-
CYP2B6		*18+Unknown/*9	Unable to determine	-
CYP2C19		*1/*2	Intermediate Metabolizer	-
CYP2C9		*1/*8	Intermediate Metabolizer	1.5
CYP2D6		*2/*2x2	Ultrarapid Metabolizer	3.0
CYP3A4		*1/*15	Unable to determine	-
CYP3A5		*1/*6	Intermediate Metabolizer	-
CYP4F2		*1/*2	Unable to determine	-
DPYD		Reference/Reference	Normal Metabolizer	2.0
FAAH		rs324420A/rs324420A	Decreased Function	-
GIPR		rs1800437G/rs1800437G	Normal Function	-
GLP1R	C C	rs10305420C/rs10305420C	Typical Response	-
IFNL3	C T	rs12979860C/rs12979860T	Unfavorable Response Genotype	-
NAT2		*4/*5	Intermediate Metabolizer	-
NUDT15		*1/*1	Normal Metabolizer	-
RYR1		Reference/Reference	No known risk variants found	-
SLCO1B1		*31/*37	Decreased Function	-
SULT1A1		*1/*2	Decreased Function	-
TPMT		*1/*1	Normal Metabolizer	-
UGT1A1		*1/*60	Normal Metabolizer	-
VKORC1	G G	-1639G/-1639G	Normal Expression	-

Color shows the overall gene result. Dot fill shows each copy's function; lettered dots show your DNA letters where copy function isn't defined.

Normal / typical / favorable Intermediate / decreased Poor / increased risk Rapid / increased Not determined

Filled dots: works normally. Half-filled: works less well. Empty: does not work. Ringed: more active than usual. Dotted gray: not determined. Letters show DNA bases without assigning copy function. A non-normal allele does not necessarily change medication guidance.

Complete medication guidance

All 120 medications, grouped by drug class. Each source's wording and evidence level are retained; sources may offer different recommendations.

Antidepressants 14 medications

9 Consider alternative 3 Use with caution 2 Use as directed

SNRIS

Venlafaxine

USE AS DIRECTED

Effexor XR

Your body may break down this drug faster than usual, but no dose change is advised.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 USE AS DIRECTED Read the guideline

WHAT IT MEANS Increased metabolism of venlafaxine to the active metabolite O-desmethylvenlafaxine (desvenlafaxine) and increased O-desmethylvenlafaxine:venlafaxine ratio compared with normal metabolizers. There is insufficient evidence supporting the clinical impact of this increased ratio.

WHAT THE GUIDELINE SUGGESTS No action recommended based on genotype for venlafaxine because of minimal evidence regarding the impact on efficacy or side effects.

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body processes venlafaxine faster than most people, but there is no specific FDA guidance for your genotype. The standard dose is typically used.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Citalopram

USE WITH CAUTION

Celexa

Your body may break down the drug more slowly, increasing side effects. Your doctor may use a lower dose or adjust it more slowly.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Reduced metabolism when compared with CYP2C19 normal metabolizers. Higher plasma concentrations may increase the probability of side effects.

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. Consider a slower titration schedule and lower maintenance dose than normal metabolizers.

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body breaks down citalopram slightly slower than normal. The standard dose should work as expected.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Escitalopram

USE WITH CAUTION

Lexapro

Your body may break down the drug more slowly, increasing side effects. Your doctor may use a lower dose or adjust it more slowly.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Reduced metabolism when compared with CYP2C19 normal metabolizers. Higher plasma concentrations may increase the probability of side effects.

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. Consider a slower titration schedule and lower maintenance dose than normal metabolizers.

Fluvoxamine

USE AS DIRECTED

Luvox

There is not enough data to know how your genetics affect response to this drug.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 USE AS DIRECTED Read the guideline

WHAT IT MEANS No data available for CYP2D6 ultrarapid metabolizers.

WHAT THE GUIDELINE SUGGESTS No recommendation due to lack of evidence.

Paroxetine

CONSIDER ALTERNATIVE

Paxil, Seroxat

Your body clears this drug very fast, so it may not work well. A different drug is usually suggested.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 CONSIDER ALTERNATIVE Evidence: moderate Read the guideline

WHAT IT MEANS Increased metabolism of paroxetine to less active compounds compared with CYP2D6 normal metabolizers. Lower plasma concentrations decrease the probability of clinical benefit.

WHAT THE GUIDELINE SUGGESTS Select alternative drug not predominantly metabolized by CYP2D6.

Sertraline

USE WITH CAUTION

Zoloft

Your body processes this drug a bit more slowly. You can start at the usual dose, but your doctor may raise it slowly.

CYP2C19 Intermediate metabolizer **CYP2B6** Indeterminate

CYP2C19: Intermediate metabolizer; **CYP2B6:** Indeterminate

CPIC GUIDELINE, BOTH GENES TOGETHER UNABLE TO DETERMINE Evidence: moderate Read the guideline

IN PLAIN WORDS We couldn't read the gene this drug depends on, so we can't say how you'll respond.

A combined CYP2C19 + CYP2B6 recommendation could not be given because one of the two genes was not called or has an indeterminate result. See the per-gene detail below.

From the combined CYP2C19 and CYP2B6 table in CPIC's guideline for serotonin reuptake inhibitor antidepressants.

Sertraline

USE WITH CAUTION

Zoloft

Your body processes this drug a bit more slowly. You can start at the usual dose, but your doctor may raise it slowly.

CYP2C19 Intermediate metabolizer **CYP2B6** Indeterminate

CYP2B6: Indeterminate

CPIC GUIDELINE, CYP2B6 UNABLE TO DETERMINE Read the guideline

IN PLAIN WORDS The impact of your genotype on response to this drug is unknown.

WHAT IT MEANS No CPIC guidance for this phenotype.

WHAT THE GUIDELINE SUGGESTS A genotype-based dosing recommendation cannot be determined from this result.

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Reduced metabolism of sertraline to less active compounds when compared with CYP2C19 normal metabolizers.

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. Consider a slower titration schedule and lower maintenance dose than CYP2C19 normal metabolizers.

Vortioxetine

CONSIDER ALTERNATIVE

Trintellix, Brintellix

Your body clears this drug very fast, so it may not work as well. A different antidepressant is often suggested, or a higher dose.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 CONSIDER ALTERNATIVE Evidence: optional Read the guideline

WHAT IT MEANS Increased metabolism of vortioxetine to inactive compounds compared with normal metabolizers. Lower plasma concentrations decrease the probability of clinical benefit.

WHAT THE GUIDELINE SUGGESTS Select alternative drug not predominantly metabolized by CYP2D6. If vortioxetine use is warranted, initiate therapy at standard starting dose and titrate to maintenance dose based on efficacy and side effects. Increasing the target maintenance dose by 50% or more may be needed for efficacy.

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

IN PLAIN WORDS You may break down this drug faster than usual, but the drug label gives no dose change for your result.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Amitriptyline

CONSIDER ALTERNATIVE

Elavil

Your two genes together change how your body handles this drug. It may cause more side effects or not work as well, so a different antidepressant is often suggested.

CYP2D6 Ultrarapid metabolizer **CYP2C19** Intermediate metabolizer

CYP2D6: Ultrarapid metabolizer (activity score 3.0); **CYP2C19:** Intermediate metabolizer

CPIC GUIDELINE, BOTH GENES TOGETHER CONSIDER ALTERNATIVE Evidence: optional Read the guideline

WHAT IT MEANS CYP2D6: Increased metabolism of TCAs to less active compounds compared to normal metabolizers; Lower plasma concentrations of active drug will increase probability of pharmacotherapy failure CYP2C19: Reduced metabolism of tertiary amines compared to normal metabolizers

WHAT THE GUIDELINE SUGGESTS Avoid amitriptyline use; If amitriptyline is warranted, utilize therapeutic drug monitoring to guide dose adjustment. Utilizing therapeutic drug monitoring to guide dose adjustments is strongly recommended.

From the combined CYP2D6 and CYP2C19 table in CPIC's guideline for tricyclic antidepressants. CYP2D6 is matched on its activity score.

CPIC reads your CYP2D6 and CYP2C19 results together for amitriptyline, so this label reflects both genes.

Clomipramine

CONSIDER ALTERNATIVE

Anafranil

Your two genes together change how your body handles this drug. It may cause more side effects or not work as well, so a different antidepressant is often suggested.

CYP2D6 Ultrarapid metabolizer **CYP2C19** Intermediate metabolizer

CYP2D6: Ultrarapid metabolizer (activity score 3.0); **CYP2C19:** Intermediate metabolizer

CPIC GUIDELINE, BOTH GENES TOGETHER CONSIDER ALTERNATIVE Evidence: optional Read the guideline

WHAT IT MEANS CYP2D6: Increased metabolism of TCAs to less active compounds compared to normal metabolizers; Lower plasma concentrations of active drug will increase probability of pharmacotherapy failure CYP2C19: Reduced metabolism of tertiary amines compared to normal metabolizers

WHAT THE GUIDELINE SUGGESTS Avoid clomipramine use; If clomipramine is warranted, utilize therapeutic drug monitoring to guide dose adjustment. Utilizing therapeutic drug monitoring to guide dose adjustments is strongly recommended.

From the combined CYP2D6 and CYP2C19 table in CPIC's guideline for tricyclic antidepressants. CYP2D6 is matched on its activity score.

CPIC reads your CYP2D6 and CYP2C19 results together for clomipramine, so this label reflects both genes.

Desipramine

CONSIDER ALTERNATIVE

Norpramin

Your body breaks down desipramine much faster than normal, which may make the drug less effective. An alternative medication that is not affected by your CYP2D6 gene may be recommended.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 CONSIDER ALTERNATIVE Evidence: optional Read the guideline

WHAT IT MEANS Increased metabolism of TCAs to less active compounds compared to normal metabolizers. Lower plasma concentrations of active drug will increase probability of pharmacotherapy failure.

WHAT THE GUIDELINE SUGGESTS Avoid tricyclic use due to potential lack of efficacy. Consider alternative drug not metabolized by CYP2D6. If a TCA is warranted, consider titrating to a higher target dose (compared to normal metabolizers). Utilize therapeutic drug monitoring to guide dose adjustments.

Doxepin

CONSIDER ALTERNATIVE

Sinequan, Quitaxon, Aponal

Your two genes together change how your body handles this drug. It may cause more side effects or not work as well, so a different antidepressant is often suggested.

CYP2D6 Ultrarapid metabolizer **CYP2C19** Intermediate metabolizer

CYP2D6: Ultrarapid metabolizer (activity score 3.0); **CYP2C19:** Intermediate metabolizer

CPIC GUIDELINE, BOTH GENES TOGETHER CONSIDER ALTERNATIVE Evidence: optional Read the guideline

WHAT IT MEANS CYP2D6: Increased metabolism of TCAs to less active compounds compared to normal metabolizers; Lower plasma concentrations of active drug will increase probability of pharmacotherapy failure CYP2C19: Reduced metabolism of tertiary amines compared to normal metabolizers

WHAT THE GUIDELINE SUGGESTS Avoid doxepin use; If doxepin is warranted, utilize therapeutic drug monitoring to guide dose adjustment. Utilizing therapeutic drug monitoring to guide dose adjustments is strongly recommended.

From the combined CYP2D6 and CYP2C19 table in CPIC's guideline for tricyclic antidepressants. CYP2D6 is matched on its activity score.

CPIC reads your CYP2D6 and CYP2C19 results together for doxepin, so this label reflects both genes.

Imipramine

CONSIDER ALTERNATIVE

Tofranil

Your two genes together change how your body handles this drug. It may cause more side effects or not work as well, so a different antidepressant is often suggested.

CYP2D6 Ultrarapid metabolizer **CYP2C19** Intermediate metabolizer

CYP2D6: Ultrarapid metabolizer (activity score 3.0); **CYP2C19:** Intermediate metabolizer

CPIC GUIDELINE, BOTH GENES TOGETHER CONSIDER ALTERNATIVE Evidence: optional Read the guideline

WHAT IT MEANS CYP2D6: Increased metabolism of TCAs to less active compounds compared to normal metabolizers; Lower plasma concentrations of active drug will increase probability of pharmacotherapy failure CYP2C19: Reduced metabolism of tertiary amines compared to normal metabolizers

WHAT THE GUIDELINE SUGGESTS Avoid imipramine use; If imipramine is warranted, utilize therapeutic drug monitoring to guide dose adjustment. Utilizing therapeutic drug monitoring to guide dose adjustments is strongly recommended.

From the combined CYP2D6 and CYP2C19 table in CPIC's guideline for tricyclic antidepressants. CYP2D6 is matched on its activity score.

CPIC reads your CYP2D6 and CYP2C19 results together for imipramine, so this label reflects both genes.

Nortriptyline

CONSIDER ALTERNATIVE

Pamelor

Your body breaks down nortriptyline much faster than normal, which means the drug may not reach effective levels. A different antidepressant or a higher dose may be needed.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 CONSIDER ALTERNATIVE Evidence: strong Read the guideline

WHAT IT MEANS Increased metabolism of TCAs to less active compounds compared to normal metabolizers. Lower plasma concentrations of active drug will increase probability of pharmacotherapy failure.

WHAT THE GUIDELINE SUGGESTS Avoid tricyclic use due to potential lack of efficacy. Consider alternative drug not metabolized by CYP2D6. If a TCA is warranted, consider titrating to a higher target dose (compared to normal metabolizers). Utilize therapeutic drug monitoring to guide dose adjustments.

Trimipramine

CONSIDER ALTERNATIVE

Surmontil

Your two genes together change how your body handles this drug. It may cause more side effects or not work as well, so a different antidepressant is often suggested.

CYP2D6 Ultrarapid metabolizer **CYP2C19** Intermediate metabolizer

CYP2D6: Ultrarapid metabolizer (activity score 3.0); **CYP2C19:** Intermediate metabolizer

CPIC GUIDELINE, BOTH GENES TOGETHER CONSIDER ALTERNATIVE Evidence: optional Read the guideline

WHAT IT MEANS CYP2D6: Increased metabolism of TCAs to less active compounds compared to normal metabolizers; Lower plasma concentrations of active drug will increase probability of pharmacotherapy failure CYP2C19: Reduced metabolism of tertiary amines compared to normal metabolizers

WHAT THE GUIDELINE SUGGESTS Avoid trimipramine use; If trimipramine is warranted, utilize therapeutic drug monitoring to guide dose adjustment. Utilizing therapeutic drug monitoring to guide dose adjustments is strongly recommended.

From the combined CYP2D6 and CYP2C19 table in CPIC's guideline for tricyclic antidepressants. CYP2D6 is matched on its activity score.

CPIC reads your CYP2D6 and CYP2C19 results together for trimipramine, so this label reflects both genes.

Antipsychotics 12 medications

3 Use with caution 8 Use as directed 1 Unable to determine

Aripiprazole

USE AS DIRECTED

Abilify

Your body clears aripiprazole a little faster, but there is no evidence this makes it work less well. No dose change is needed.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

DPWG GUIDELINE, CYP2D6 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Increased CYP2D6 activity lowers the combined blood level of aripiprazole and its active metabolite dehydroaripiprazole to a limited degree. There is no evidence that this reduces effectiveness.

WHAT THE GUIDELINE SUGGESTS No action is required. Use standard aripiprazole dosing.

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body processes aripiprazole faster than normal. The standard dose should work as expected.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Aripiprazole Lauroxil

USE AS DIRECTED

Aristada

Your CYP2D6 result means higher CYP2D6 activity than usual, but the FDA gives no genetic dosing change for aripiprazole lauroxil at this result.

 **CYP2D6** Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Brexpiprazole

USE AS DIRECTED

Rexulti

Your body clears brexpiprazole a little faster, but there is no sign this makes it work less well. No dose change is needed.

 **CYP2D6** Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

DPWG GUIDELINE, CYP2D6 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Increased CYP2D6 activity lowers exposure to brexpiprazole, but there are no indications that this reduces effectiveness.

WHAT THE GUIDELINE SUGGESTS No action is required. Use standard brexpiprazole dosing.

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body processes brexpiprazole faster than most people, but there is no specific FDA guidance for your genotype. The standard dose is typically used.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Clozapine

USE AS DIRECTED

Clozaril

Your CYP2D6 result does not change how clozapine should be dosed.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

DPWG GUIDELINE, CYP2D6 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS CYP2D6 variation can change clozapine blood levels, but this has no clinical consequences.

WHAT THE GUIDELINE SUGGESTS No action is required. Use standard clozapine dosing.

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body may clear this drug faster than average. The FDA label gives no dose change for your result.

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Haloperidol

USE WITH CAUTION

Haldol

Your body clears this drug faster, so the usual dose may not work as well. A higher dose or a different drug is often suggested.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

DPWG GUIDELINE, CYP2D6 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Increased CYP2D6 activity leads to accelerated conversion of haloperidol. Plasma concentration is approximately 40% lower than in Normal Metabolizers, risking reduced effectiveness.

WHAT THE GUIDELINE SUGGESTS Use 1.5 times the normal dose, or choose an alternative. Antipsychotics not metabolised (or metabolised to a much lesser extent) by CYP2D6 include flupentixol, penfluridol, quetiapine, olanzapine, or clozapine.

Iloperidone

USE AS DIRECTED

Fanapt

Your body may clear this drug faster than average. The FDA label gives no dose change for your result.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Perphenazine

USE AS DIRECTED

Trilafon

Your body processes perphenazine faster than most people, but there is no specific FDA guidance for your genotype. The standard dose is typically used.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Pimozide

USE AS DIRECTED

Orap

Your body may clear pimozide a little faster, but there is no evidence it works less well. No dose change is needed.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

DPWG GUIDELINE, CYP2D6 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Increased CYP2D6 activity can lower pimozide concentrations, but there is no evidence of reduced effectiveness.

WHAT THE GUIDELINE SUGGESTS No action is required. Use standard pimozide dosing.

Pimozide

USE AS DIRECTED

Orap

Your body may clear pimozide a little faster, but there is no evidence it works less well. No dose change is needed.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your CYP2D6 result means higher CYP2D6 activity than usual, but the FDA gives no genetic dosing change for pimozide at this result.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Quetiapine

UNABLE TO DETERMINE

Seroquel

We couldn't read your CYP3A4 gene from your data, so we can't tailor advice for this drug.

CYP3A4 Indeterminate

CYP3A4: Indeterminate

DPWG GUIDELINE, CYP3A4 UNABLE TO DETERMINE Read the guideline

WHAT IT MEANS CYP3A4 genotype could not be confidently determined.

WHAT THE GUIDELINE SUGGESTS A genotype-based dosing recommendation cannot be determined from this result.

Risperidone

USE WITH CAUTION

Risperdal

Your body turns risperidone into its active form faster than usual, and it is more likely not to work well for you. Your doctor may choose a different drug or adjust the dose carefully.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

DPWG GUIDELINE, CYP2D6 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Increased CYP2D6 activity raises the ratio of the active metabolite (9-hydroxyrisperidone, or paliperidone) to risperidone. The share of patients with therapy failure rises from 16% to 37%.

WHAT THE GUIDELINE SUGGESTS Choose an alternative or titrate the dose according to the maximum dose for the active metabolite (paliperidone) (oral 12 mg/day for adults and children from 15 years of age weighing at least 51 kg and 6 mg/day for children from 15 years of age weighing less than 51 kg; intramuscular 75 mg per 2 weeks).

Thioridazine

USE AS DIRECTED

Mellaril

Your body processes thioridazine faster than most people, but there is no specific FDA guidance for your genotype. The standard dose is typically used.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Zuclopenthixol

USE WITH CAUTION

Clopixol

Your body clears this drug faster than usual, so it may not work as well. If it doesn't, your doctor may raise the dose or try a different drug.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

DPWG GUIDELINE, CYP2D6 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Increased CYP2D6 activity accelerates zuclopenthixol conversion, which can reduce plasma concentration and risk ineffectiveness.

WHAT THE GUIDELINE SUGGESTS Insufficient data to make a firm dosage recommendation. If effectiveness is insufficient, try a dose increase, but do not exceed 1.5 times the normal dose. Alternatively, consider an antipsychotic that is not metabolised (or to a lesser extent) by CYP2D6 (e.g., flupentixol, quetiapine, olanzapine, clozapine).

Psychostimulants 2 medications

1 Use with caution 1 Use as directed

Amphetamine

USE AS DIRECTED

Adzenys ER

Your body processes amphetamine faster than most people, but there is no specific FDA guidance for your genotype. The standard dose is typically used.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Atomoxetine

USE WITH CAUTION

Strattera

Your body clears this medicine very quickly, so you may need a higher dose to get the right effect.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Based on very limited data available for CYP2D6 ultrarapid metabolizers taking atomoxetine, it is unlikely ultrarapid metabolizers would achieve adequate serum concentrations for the intended effect at standard dosing.

WHAT THE GUIDELINE SUGGESTS Initiate with a dose of 40 mg/day and increase to 80 mg/day after 3 days. If no clinical response and in the absence of adverse events after 2 weeks, consider increasing dose to 100 mg/day. If no clinical response observed after 2 weeks, consider obtaining a peak plasma concentration (1 to 2 hours after dose administered). If <200 ng/ml, consider a proportional increase in dose to approach 400 ng/ml. Dosages greater than 100 mg/day may be needed to achieve target concentrations.

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your CYP2D6 result means higher CYP2D6 activity than usual, but the FDA gives no genetic dosing change for atomoxetine at this result.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Movement disorders 3 medications

3 Use as directed

INVOLUNTARY MOVEMENT REDUCERS

Deutetrabenazine

USE AS DIRECTED

Austedo

Your body processes deutetrabenazine faster than normal. The standard dose should work as expected.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6	USE AS DIRECTED	See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Tetrabenazine

USE AS DIRECTED

Xenazine

Your body processes tetrabenazine faster than average, but no specific dosing changes are recommended. The standard dose should work as expected.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6	USE AS DIRECTED	See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Valbenazine

USE AS DIRECTED

Ingrezza

Your body processes valbenazine faster than most people, but there is no specific FDA guidance for your genotype. The standard dose is typically used.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6	USE AS DIRECTED	See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Anticonvulsants 4 medications

4 Use with caution

Brivaracetam

USE WITH CAUTION

Briviact

Your body breaks down this drug more slowly, so more of it builds up. This can raise the risk of side effects.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 USE WITH CAUTION See the FDA table

WHAT IT MEANS Results in higher systemic concentrations and higher adverse reaction risk.

WHAT THE LABEL SUGGESTS No specific dosing change for intermediate metabolizers. Refer to FDA labeling.

Clobazam

USE WITH CAUTION

Onfi, Frisium

Your body breaks down clobazam more slowly than normal, causing higher levels of the drug's active form to build up. A lower dose may be needed to reduce the risk of side effects.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 USE WITH CAUTION See the FDA table

WHAT IT MEANS Results in higher systemic active metabolite concentrations. Poor metabolism results in higher adverse reaction risk. Dosage adjustment is recommended. Refer to FDA labeling for specific dosing recommendations.

WHAT THE LABEL SUGGESTS Dosage adjustment is recommended; the FDA label gives specific dosing for poor metabolizers.

Fosphenytoin

USE WITH CAUTION

Cerebyx

Your body clears this drug more slowly, so it can build up and cause nervous system side effects. A lower starting dose and blood level checks are suggested.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

IN PLAIN WORDS Your body slows the drug slightly, but no dose changes are usually needed.

WHAT IT MEANS Slightly reduced fosphenytoin metabolism; however, this does not appear to translate into increased side effects.

WHAT THE GUIDELINE SUGGESTS No adjustments needed from typical dosing strategies. Subsequent doses should be adjusted according to therapeutic drug monitoring, response, and side effects. An HLA-B*15:02 negative test does not eliminate the risk of phenytoin-induced SJS/TEN, and patients should be carefully monitored according to standard practice.

CYP2C9: Intermediate metabolizer (activity score 1.5)

FDA DRUG LABEL, CYP2C9 USE WITH CAUTION See the FDA table

WHAT IT MEANS May result in higher systemic concentrations and higher adverse reaction risk (central nervous system toxicity). Consider starting at the lower end of the dosage range and monitor serum concentrations. Refer to FDA labeling for specific dosing recommendations. Carriers of CYP2C9*3 alleles may be at increased risk of severe cutaneous adverse reactions. Consider avoiding fosphenytoin as an alternative to carbamazepine in patients who are CYP2C9*3 carriers. Genotyping is not a substitute for clinical vigilance and patient management.

WHAT THE LABEL SUGGESTS Consider starting at the lower end of the dosage range and monitor serum concentrations. CYP2C9*3 carriers may be at higher risk of severe skin reactions; consider avoiding fosphenytoin as an alternative to carbamazepine in them.

Phenytoin

USE WITH CAUTION

Dilantin

Your body breaks down this drug more slowly, so it can build up. That raises the risk of side effects on the brain and nerves.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

IN PLAIN WORDS Your body slows the drug slightly, but no dose changes are usually needed.

WHAT IT MEANS Slightly reduced phenytoin metabolism; however, this does not appear to translate into increased side effects.

WHAT THE GUIDELINE SUGGESTS No adjustments needed from typical dosing strategies. Subsequent doses should be adjusted according to therapeutic drug monitoring, response, and side effects. An HLA-B*15:02 negative test does not eliminate the risk of phenytoin-induced SJS/TEN, and patients should be carefully monitored according to standard practice.

Phenytoin

USE WITH CAUTION

Dilantin

Your body breaks down this drug more slowly, so it can build up. That raises the risk of side effects on the brain and nerves.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

FDA DRUG LABEL, CYP2C9 USE WITH CAUTION See the FDA table

WHAT IT MEANS May result in higher systemic concentrations and higher adverse reaction risk (central nervous system toxicity). Refer to FDA labeling for specific dosing recommendations. Carriers of CYP2C9*3 alleles may be at increased risk of severe cutaneous adverse reactions. Consider avoiding phenytoin as an alternative to carbamazepine in patients who are CYP2C9*3 carriers. Genotyping is not a substitute for clinical vigilance and patient management.

WHAT THE LABEL SUGGESTS Refer to FDA labeling for dosing. CYP2C9*3 carriers may be at higher risk of severe skin reactions; consider avoiding phenytoin as an alternative to carbamazepine in them.

Pain management 13 medications

2 Consider alternative 2 Use with caution 9 Use as directed

Carisoprodol

USE AS DIRECTED

Soma

Your body breaks down carisoprodol slightly slower than normal. The standard dose should work as expected.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 USE AS DIRECTED Evidence: moderate See the FDA table

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Celecoxib

USE AS DIRECTED

Celebrex

Your body slows the drug down slightly, but usually the normal starting dose is fine.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Mildly reduced metabolism

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. In accordance with the prescribing information, use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals.

Celecoxib

USE AS DIRECTED

Celebrex

Your body slows the drug down slightly, but usually the normal starting dose is fine.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

FDA DRUG LABEL, CYP2C9 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your CYP2C9 result means somewhat lower CYP2C9 activity than usual, but the FDA gives no genetic dosing change for celecoxib at this result.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Codeine

CONSIDER ALTERNATIVE

Tylenol 3

Your body turns codeine into morphine too fast, which can cause dangerous side effects. A different pain reliever is usually suggested.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 CONSIDER ALTERNATIVE Evidence: strong Read the guideline

WHAT IT MEANS Increased formation of morphine leading to higher risk of toxicity

WHAT THE GUIDELINE SUGGESTS Avoid codeine use because of potential for serious toxicity. If opioid use is warranted, consider a non-tramadol opioid.

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 CONSIDER ALTERNATIVE See the FDA table

IN PLAIN WORDS Your body turns codeine into morphine too fast. This can cause dangerous side effects, such as slowed breathing. A different pain reliever is usually suggested.

WHAT IT MEANS Results in higher systemic active metabolite concentrations and higher adverse reaction risk (life-threatening respiratory depression and death). Codeine is contraindicated in children under 12 years of age.

WHAT THE LABEL SUGGESTS Codeine is contraindicated in children under 12 years. Refer to FDA labeling, which warns of life-threatening respiratory depression in ultrarapid metabolizers.

Flurbiprofen

USE AS DIRECTED

Ansaid, Ocufen, Strefen

Your body slows the drug down slightly, but usually the normal starting dose is fine.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Mildly reduced metabolism

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. In accordance with the prescribing information, use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals.

CYP2C9: Intermediate metabolizer (activity score 1.5)

FDA DRUG LABEL, CYP2C9 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body may break down this drug a little slower than average. The FDA label gives no dose change for your result.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Hydrocodone

USE AS DIRECTED

Hysingla ER

There isn't enough evidence to say whether your result changes how hydrocodone works for you, so the guideline makes no recommendation.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 USE AS DIRECTED Read the guideline

WHAT IT MEANS Minimal evidence for pharmacokinetic or clinical effect.

WHAT THE GUIDELINE SUGGESTS No recommendation for hydrocodone therapy because of minimal evidence regarding adverse events or analgesia.

Ibuprofen

USE AS DIRECTED

Advil

Your body slows the drug down slightly, but usually the normal starting dose is fine.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Mildly reduced metabolism

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. In accordance with the prescribing information, use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals.

Lornoxicam

USE AS DIRECTED

Xefo

Your body slows the drug down slightly, but usually the normal starting dose is fine.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Mildly reduced metabolism

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. In accordance with the prescribing information, use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals.

Meloxicam

USE WITH CAUTION

Mobic

Your body breaks down meloxicam slightly slower than normal. While there is no specific FDA guidance, your doctor may want to monitor you for side effects.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

IN PLAIN WORDS Your body slows the drug slightly, but usually the normal starting dose is fine.

WHAT IT MEANS Mildly reduced metabolism

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. In accordance with the meloxicam prescribing information, use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals.

Meloxicam

USE WITH CAUTION

Mobic

Your body breaks down meloxicam slightly slower than normal. While there is no specific FDA guidance, your doctor may want to monitor you for side effects.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

FDA DRUG LABEL, CYP2C9 USE WITH CAUTION See the FDA table

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Oliceridine

USE AS DIRECTED

Olinvyk

Your body processes oliceridine faster than normal. The standard dose should work as expected.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Piroxicam

USE WITH CAUTION

Feldene

Your body breaks down piroxicam more slowly than normal, which can cause higher drug levels. Your doctor may need to adjust your dosing.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

IN PLAIN WORDS Your body slows the drug slightly, but the usual starting dose is still fine.

WHAT IT MEANS Mildly reduced metabolism

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. In accordance with the prescribing information, use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals.

Piroxicam

USE WITH CAUTION

Feldene

Your body breaks down piroxicam more slowly than normal, which can cause higher drug levels. Your doctor may need to adjust your dosing.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

FDA DRUG LABEL, CYP2C9 USE WITH CAUTION See the FDA table

WHAT IT MEANS Results in higher systemic concentrations.

WHAT THE LABEL SUGGESTS No specific dosing change for intermediate metabolizers. Refer to FDA labeling.

Pitolisant

USE AS DIRECTED

Wakix

Your body processes this drug faster than average. The FDA gives no dose change for your result, so the usual dose is used.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Tenoxicam

USE AS DIRECTED

Mobiflex

Your body slows the drug slightly, but the usual starting dose is still fine.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer (activity score 1.5)

CPIC GUIDELINE, CYP2C9 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Mildly reduced metabolism

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended starting dose. In accordance with the prescribing information, use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals.

Tramadol

CONSIDER ALTERNATIVE

Ultram, ConZip

Your body turns this drug into its active form too fast, which raises the risk of serious side effects. A different pain medicine is advised.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 CONSIDER ALTERNATIVE Evidence: strong Read the guideline

WHAT IT MEANS Increased formation of O-desmethyltramadol (active metabolite) leading to higher risk of toxicity

WHAT THE GUIDELINE SUGGESTS Avoid tramadol use because of potential for toxicity. If opioid use is warranted, consider a non-codeine opioid.

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 CONSIDER ALTERNATIVE Evidence: strong See the FDA table

IN PLAIN WORDS Your body turns this drug into its active form too fast. This can cause dangerous breathing problems, especially in children and breastfed babies. A different pain medicine is advised.

WHAT IT MEANS Results in higher systemic and breast milk active metabolite concentrations, which may result in respiratory depression and death. Contraindicated in children under 12 and in adolescents following tonsillectomy/adenoidectomy. Breastfeeding is not recommended during treatment.

WHAT THE LABEL SUGGESTS Avoid use. Use an alternative analgesic that is not metabolized by CYP2D6. Contraindicated in children under 12 and adolescents following tonsillectomy/adenoidectomy. Breastfeeding is not recommended.

Cardiovascular 7 medications

1 Consider alternative 3 Use with caution 3 Use as directed

ANTIARRHYTHMICS

Propafenone

USE AS DIRECTED

Rythmol SR

Your body processes propafenone faster than most people, but there is no specific FDA guidance for your genotype. The standard dose is typically used.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

ANTIHYPERTENSIVES

Hydralazine

USE WITH CAUTION

Apresoline

Your body breaks down hydralazine somewhat quickly. You will likely need a higher total daily dose to get a good effect.

NAT2 Intermediate metabolizer

NAT2: Intermediate metabolizer

CPIC GUIDELINE, NAT2 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Predicted to have reduced plasma concentrations and efficacy of hydralazine compared to NAT2 poor metabolizers.

WHAT THE GUIDELINE SUGGESTS Consider a starting total daily dose of at least 75 mg. Titrate up to 300 mg total daily hydralazine dose as tolerated. NAT2 intermediate metabolizers typically require a 50-100% higher maintenance dose compared to poor metabolizers.

BETA BLOCKERS

Carvedilol

USE AS DIRECTED

Coreg, Coreg CR

Your body processes carvedilol faster than most people, but there is no specific FDA guidance for your genotype. The standard dose is typically used.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Metoprolol

USE AS DIRECTED

Lopressor, Toprol XL

Your body may clear metoprolol faster than usual, but there isn't enough evidence to know whether that changes how well it works, so there is no genetic recommendation.

 **CYP2D6** Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 USE AS DIRECTED Read the guideline

WHAT IT MEANS Increased metabolism of metoprolol leading to decreased drug concentrations; however, it is unclear whether this results in clinically significant changes in heart rate, blood pressure, or clinical outcomes.

WHAT THE GUIDELINE SUGGESTS No recommendation for metoprolol therapy due to insufficient evidence regarding diminished metoprolol effectiveness clinically.

BLOOD THINNERS

Clopidogrel

CONSIDER ALTERNATIVE

Plavix

Your body turns this drug into its active form more slowly, so it may not protect you as well. A different blood thinner is usually suggested.

 **CYP2C19** Intermediate metabolizer

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 CONSIDER ALTERNATIVE Evidence: strong Read the guideline

WHAT IT MEANS Reduced clopidogrel active metabolite formation; increased on-treatment platelet reactivity; increased risk for adverse cardiac and cerebrovascular events

WHAT THE GUIDELINE SUGGESTS Avoid standard dose (75 mg) clopidogrel if possible. Use prasugrel or ticagrelor at standard dose if no contraindication

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 CONSIDER ALTERNATIVE Evidence: moderate See the FDA table

IN PLAIN WORDS This drug may not work as well for you, which can raise the risk of heart problems. Your doctor may use a different drug to prevent clots.

WHAT IT MEANS Results in lower systemic active metabolite concentrations, lower antiplatelet response, and may result in higher cardiovascular risk. Consider use of another platelet P2Y12 inhibitor.

WHAT THE LABEL SUGGESTS Results in lower systemic active metabolite concentrations, lower antiplatelet response, and may result in higher cardiovascular risk. Consider use of another platelet P2Y12 inhibitor.

Warfarin

USE WITH CAUTION

Coumadin

Your genes suggest a lower dose may be safer. Your doctor can decide.

CYP2C9 Intermediate metabolizer **VKORC1** Normal expression **CYP4F2** Indeterminate

CYP2C9: Intermediate metabolizer; **VKORC1:** Normal expression; **CYP4F2:** Indeterminate

CPIC GUIDELINE, ALL THREE GENES TOGETHER USE WITH CAUTION Evidence: strong Read the guideline

Estimated dose: **3.5-6 mg/day** (lower than typical starting dose).

Based on your CYP2C9 (*1/*8) and VKORC1 (-1639G/-1639G) genotypes, your predicted stable warfarin dose is 3.5-6 mg/day (decreased ~15-30% for CYP2C9 *5/*6/*8/*11). This estimate is genotype-based only and does not account for age, weight, or interacting drugs. A clinician should confirm the starting dose using a validated pharmacogenetic dosing algorithm.

Base genotype dose (CYP2C9 *1/*1, VKORC1 GG): 5-7 mg/day. Because you carry a CYP2C9 *5, *6, *8, or *11 reduced-function allele, your estimated dose is decreased by about 15-30%.

CPIC reads your CYP2C9, VKORC1 and CYP4F2 results together for warfarin, so this label reflects all of them.

CARDIOMYOPATHY

Mavacamten

USE WITH CAUTION

Camzyos

Your body breaks down mavacamten slightly slower than normal, which may lead to higher drug levels. Your doctor will monitor you closely and adjust the dose based on your response.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 USE WITH CAUTION Evidence: moderate See the FDA table

WHAT IT MEANS Results in higher systemic concentrations and may have higher adverse reaction risk (heart failure). Dosage is based on individual response. The dose titration and monitoring schedule accounts for differences due to CYP2C19 genetic variation, so adjustments based on CYP2C19 genotype are not necessary. Refer to FDA labeling for specific dosing recommendations and monitoring.

WHAT THE LABEL SUGGESTS Follow the label's dose titration and monitoring schedule; no genotype-based adjustment is needed.

Cholesterol medications 7 medications

1 Consider alternative 5 Use with caution 1 Use as directed

Atorvastatin

USE WITH CAUTION

Lipitor

More of this statin stays in your blood, which can raise the chance of muscle side effects. Your doctor may limit the dose.

SLCO1B1 Decreased function

SLCO1B1: Decreased function

CPIC GUIDELINE, SLCO1B1 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Increased atorvastatin exposure as compared with normal function, which may translate to increased myopathy risk.

WHAT THE GUIDELINE SUGGESTS Prescribe ≤40 mg as a starting dose and adjust doses of atorvastatin based on disease-specific guidelines. Prescriber should be aware of possible increased risk for myopathy especially for the 40-mg dose. If dose >40 mg is needed for desired efficacy, consider combination therapy (i.e., atorvastatin plus nonstatin guideline-directed medical therapy).

Fluvastatin

USE WITH CAUTION

Lescol

Your genes make this statin build up in your blood, which can raise the risk of muscle problems. A lower starting dose or a dose limit is suggested.

CYP2C9 Intermediate metabolizer **SLCO1B1** Decreased function

CYP2C9: Intermediate metabolizer (activity score 1.5); **SLCO1B1:** Decreased function

CPIC GUIDELINE, BOTH GENES TOGETHER USE WITH CAUTION Evidence: optional Read the guideline

WHAT IT MEANS CYP2C9: Increased fluvastatin exposure as compared to normal metabolizer which may translate to increased myopathy risk. SLCO1B1: Increased fluvastatin exposure as compared to normal function; Typical myopathy risk with ≤40 mg.

WHAT THE GUIDELINE SUGGESTS Prescribe ≤20mg per day as a starting dose and adjust doses of fluvastatin based on disease-specific guidelines. If dose >20mg needed for desired efficacy, consider an alternative statin or combination therapy (i.e., fluvastatin plus non-statin guideline directed medical therapy) (PMID: 30423391).

From the combined CYP2C9 and SLCO1B1 table in CPIC's statin guideline. CYP2C9 is matched on its activity score.

CPIC reads your CYP2C9 and SLCO1B1 results together for fluvastatin, so this label reflects both genes.

Lovastatin

CONSIDER ALTERNATIVE

Mevacor

Your genes make this statin build up in your blood, which may raise your risk of muscle problems. A different statin, or a low dose of this one, is often suggested.

SLCO1B1 Decreased function

SLCO1B1: Decreased function

CPIC GUIDELINE, SLCO1B1 CONSIDER ALTERNATIVE Evidence: moderate Read the guideline

WHAT IT MEANS Increased lovastatin acid exposure as compared with normal function, which may translate to increased myopathy risk

WHAT THE GUIDELINE SUGGESTS Consider prescribing a lower-risk alternative such as atorvastatin (10 to 20 mg), pravastatin (40 mg), or rosuvastatin (5 to 10 mg). If lovastatin is warranted, limit the dose to ≤20 mg/day to reduce the risk of muscle-related side effects.

Pitavastatin

USE WITH CAUTION

Livalo

More of this statin stays in your blood, so muscle side effects are more likely. Your doctor may keep the dose low or suggest another statin.

SLCO1B1 Decreased function

SLCO1B1: Decreased function

CPIC GUIDELINE, SLCO1B1 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Increased pitavastatin exposure as compared with normal function, which may translate to increased myopathy risk

WHAT THE GUIDELINE SUGGESTS Prescribe ≤2 mg as a starting dose and adjust doses of pitavastatin based on disease-specific guidelines. Be aware of possible increased risk for muscle-related side effects, especially for doses >1 mg. If dose >2 mg is needed for desired efficacy, consider switching to a lower-risk alternative such as atorvastatin (10 to 20 mg), pravastatin (40 mg), or rosuvastatin (5 to 10 mg), or using combination therapy (e.g., pitavastatin plus nonstatin guideline-directed medical therapy).

Pravastatin

USE WITH CAUTION

Pravachol

Your body may process this drug more slowly, so higher doses might carry added risks.

SLCO1B1 Decreased function

SLCO1B1: Decreased function

CPIC GUIDELINE, SLCO1B1 USE WITH CAUTION Evidence: moderate Read the guideline

WHAT IT MEANS Increased pravastatin exposure compared with normal function; typical myopathy risk with doses ≤40 mg

WHAT THE GUIDELINE SUGGESTS Prescribe desired starting dose and adjust doses of pravastatin based on disease-specific guidelines. Prescriber should be aware of possible increased risk for myopathy especially with doses >40 mg per day.

Rosuvastatin

USE AS DIRECTED

Crestor

Your genes support the usual starting dose of this statin.

ABCG2 Normal function **SLCO1B1** Decreased function

ABCG2: Normal function; **SLCO1B1:** Decreased function

CPIC GUIDELINE, BOTH GENES TOGETHER USE AS DIRECTED Evidence: strong Read the guideline

WHAT IT MEANS ABCG2: Typical myopathy risk and rosuvastatin exposure SLCO1B1: Increased rosuvastatin exposure as compared to normal function; Typical myopathy risk with doses ≤20 mg.

WHAT THE GUIDELINE SUGGESTS Prescribe desired starting dose and adjust doses of rosuvastatin based on disease-specific and specific population guidelines. Prescriber should be aware of possible increased risk for myopathy especially for doses >20mg.

From the combined ABCG2 and SLCO1B1 table in CPIC's statin guideline.

CPIC reads your ABCG2 and SLCO1B1 results together for rosuvastatin, so this label reflects both genes.

Simvastatin

USE WITH CAUTION

Zocor

More of this statin stays in your blood, so muscle side effects are more likely. Your doctor may use a different statin or a lower dose.

SLCO1B1 Decreased function

SLCO1B1: Decreased function

CPIC GUIDELINE, SLCO1B1 USE WITH CAUTION Evidence: strong Read the guideline

WHAT IT MEANS Increased simvastatin acid exposure compared with normal function; increased risk of muscle side effects (myopathy)

WHAT THE GUIDELINE SUGGESTS Prescribe an alternative statin depending on desired potency. Low-risk options: atorvastatin 10 to 20 mg, pitavastatin 1 mg, pravastatin 40 mg, rosuvastatin 5 to 10 mg. Moderate-risk options: fluvastatin 80 mg, pitavastatin 2 mg, pravastatin 80 mg. High-risk options (use with caution): lovastatin 40 to 80 mg, pitavastatin 4 mg, simvastatin 20 to 40 mg. If simvastatin is used, limit dose to <20 mg/day.

SLCO1B1: Decreased function

FDA DRUG LABEL, SLCO1B1 USE WITH CAUTION See the FDA table

IN PLAIN WORDS Your body clears simvastatin more slowly than normal, causing it to build up in your system. This raises your risk of muscle pain or damage, especially at higher doses.

WHAT IT MEANS Results in higher systemic concentrations and higher adverse reaction risk (myopathy). The risk of adverse reaction (myopathy) is higher for patients on 80 mg than for those on lower doses.

WHAT THE LABEL SUGGESTS No specific dosing change in the FDA table. The risk of myopathy is higher at 80 mg than at lower doses.

Antiemetics 4 medications

2 Consider alternative 1 Use with caution 1 Use as directed

Dronabinol

USE WITH CAUTION

Syndros

Your body breaks down dronabinol more slowly than normal, which may cause the drug to build up and increase the risk of side effects. Extra monitoring is recommended.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer

FDA DRUG LABEL, CYP2C9 USE WITH CAUTION See the FDA table

WHAT IT MEANS May result in higher systemic concentrations and higher adverse reaction risk. Monitor for adverse reactions.

WHAT THE LABEL SUGGESTS Monitor for adverse reactions.

Metoclopramide

USE AS DIRECTED

Reglan

Your body processes metoclopramide faster than normal. The standard dose should work as expected.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Ondansetron

CONSIDER ALTERNATIVE

Zofran

Your body breaks down this drug very fast, so it may not control nausea and vomiting. A different anti-nausea drug is usually suggested.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 CONSIDER ALTERNATIVE Evidence: moderate Read the guideline

WHAT IT MEANS Increased metabolism to less active compounds when compared to normal metabolizers and is associated with decreased response to ondansetron and tropisetron (i.e. vomiting).

WHAT THE GUIDELINE SUGGESTS Select alternative drug not predominantly metabolized by CYP2D6 (i.e., granisetron).

Tropisetron

CONSIDER ALTERNATIVE

Navoban

Your body breaks down this drug very fast, so it may not stop nausea well. A different anti-nausea drug is often suggested.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 CONSIDER ALTERNATIVE Evidence: moderate Read the guideline

WHAT IT MEANS Increased metabolism to less active compounds when compared to normal metabolizers and is associated with decreased response to ondansetron and tropisetron (i.e. vomiting).

WHAT THE GUIDELINE SUGGESTS Select alternative drug not predominantly metabolized by CYP2D6 (i.e., granisetron).

Proton pump inhibitors 4 medications

4 Use with caution

Dexlansoprazole

USE WITH CAUTION

Dexilant

Your body clears this drug more slowly. A lower dose may be needed for long-term use to prevent side effects.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 USE WITH CAUTION Evidence: optional Read the guideline

WHAT IT MEANS Increased plasma concentration of PPI compared with CYP2C19 normal metabolizers; increased chance of efficacy and potentially toxicity

WHAT THE GUIDELINE SUGGESTS Initiate standard starting daily dose. For chronic therapy (>12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.

Lansoprazole

USE WITH CAUTION

Prevacid

Your body clears this drug more slowly. A lower dose may be needed for long-term use to prevent side effects.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 USE WITH CAUTION Evidence: optional Read the guideline

WHAT IT MEANS Increased plasma concentration of PPI compared with CYP2C19 normal metabolizers; increased chance of efficacy and potentially toxicity

WHAT THE GUIDELINE SUGGESTS Initiate standard starting daily dose. For chronic therapy (>12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.

Omeprazole

USE WITH CAUTION

Prilosec, Losec

Your body clears this drug more slowly. A lower dose may be needed for long-term use to prevent side effects.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 USE WITH CAUTION Evidence: optional Read the guideline

WHAT IT MEANS Increased plasma concentration of PPI compared with CYP2C19 normal metabolizers; increased chance of efficacy and potentially toxicity

WHAT THE GUIDELINE SUGGESTS Initiate standard starting daily dose. For chronic therapy (>12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.

Pantoprazole

USE WITH CAUTION

Protonix

Your body clears this drug more slowly. A lower dose may be needed for long-term use to prevent side effects.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 USE WITH CAUTION Evidence: optional Read the guideline

WHAT IT MEANS Increased plasma concentration of PPI compared with CYP2C19 normal metabolizers; increased chance of efficacy and potentially toxicity

WHAT THE GUIDELINE SUGGESTS Initiate standard starting daily dose. For chronic therapy (>12 weeks) and efficacy achieved, consider 50% reduction in daily dose and monitor for continued efficacy.

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body processes this drug a bit slower than average. The FDA gives no dose change for your result, so the usual dose is used.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Oncology 13 medications

13 Use as directed

CHEMOTHERAPIES

Belinostat

USE AS DIRECTED

Beleodaq

Your body processes belinostat at a normal rate. The standard dose should work as expected.

UGT1A1 Normal metabolizer

UGT1A1: Normal metabolizer

FDA DRUG LABEL, UGT1A1	USE AS DIRECTED	See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Belzutifan

USE AS DIRECTED

Welireg

Your CYP2C19 result means somewhat lower CYP2C19 activity than usual, but the FDA gives no genetic dosing change for belzutifan at this result.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19	USE AS DIRECTED	See the FDA table

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Capecitabine

USE AS DIRECTED

Xeloda, Xitabin, Kapetral

Your body processes capecitabine normally. You have a typical risk of side effects, and the standard dose is expected to be appropriate.

DPYD Normal metabolizer

DPYD: Normal metabolizer (activity score 2.0)

CPIC GUIDELINE, DPYD	USE AS DIRECTED	Evidence: strong	Read the guideline

WHAT IT MEANS Normal DPD activity and “normal” risk for fluoropyrimidine toxicity

WHAT THE GUIDELINE SUGGESTS Based on genotype, there is no indication to change dose or therapy. Use label-recommended dosage and administration

Capecitabine

USE AS DIRECTED

Xeloda, Xitabin, Kapetral

Your body processes capecitabine normally. You have a typical risk of side effects, and the standard dose is expected to be appropriate.

DPYD Normal metabolizer

DPYD: Normal metabolizer (activity score 2.0)

FDA DRUG LABEL, DPYD USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body breaks down capecitabine at a normal rate. The standard dose should work as expected.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Erdafitinib

USE AS DIRECTED

Balversa

Your CYP2C9 result means somewhat lower CYP2C9 activity than usual, but the FDA gives no genetic dosing change for erdafitinib at this result.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer

FDA DRUG LABEL, CYP2C9 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Fluorouracil

USE AS DIRECTED

Adrucil, Carac

Your body breaks down this drug normally. Your risk of side effects is typical, and the usual dose is used.

DPYD Normal metabolizer

DPYD: Normal metabolizer (activity score 2.0)

CPIC GUIDELINE, DPYD USE AS DIRECTED Evidence: strong Read the guideline

WHAT IT MEANS Normal DPD activity and “normal” risk for fluoropyrimidine toxicity

WHAT THE GUIDELINE SUGGESTS Based on genotype, there is no indication to change dose or therapy. Use label-recommended dosage and administration

Fluorouracil

USE AS DIRECTED

Adrucil, Carac

Your body breaks down this drug normally. Your risk of side effects is typical, and the usual dose is used.

DPYD Normal metabolizer

DPYD: Normal metabolizer (activity score 2.0)

FDA DRUG LABEL, DPYD USE AS DIRECTED See the FDA table

IN PLAIN WORDS Your body processes fluorouracil at a normal rate. The standard dose should work as expected.

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Gefitinib

USE AS DIRECTED

Iressa

Your CYP2D6 result means higher CYP2D6 activity than usual, but the FDA gives no genetic dosing change for gefitinib at this result.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Irinotecan

USE AS DIRECTED

Camptosar, Onivyde

Your body processes irinotecan at a normal rate. The standard dose should work as expected.

UGT1A1 Normal metabolizer

UGT1A1: Normal metabolizer

FDA DRUG LABEL, UGT1A1 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Mercaptopurine

USE AS DIRECTED

Purinethol

Both genes that affect this drug look normal, so a standard starting dose is expected.

TPMT Normal metabolizer **NUDT15** Normal metabolizer

TPMT: Normal metabolizer; **NUDT15:** Normal metabolizer

CPIC GUIDELINE, BOTH GENES TOGETHER USE AS DIRECTED Evidence: strong Read the guideline

WHAT IT MEANS Both TPMT and NUDT15 predict normal thiopurine metabolism and a normal risk of myelosuppression.

WHAT THE GUIDELINE SUGGESTS Initiate therapy with standard starting dose of mecaptopurine (e.g., 75 mg/m2/day for malignancy or 1.5 mg/kg/day for nonmalignancy). During therapy, adjust the doses of myelosuppressive agents, as per standard clinical practice. It usually takes at least 2 weeks of stable dosing to reach steady state after each dose adjustment.

From the combined TPMT and NUDT15 table in CPIC's thiopurine guideline.

CPIC reads your TPMT and NUDT15 results together for mercaptopurine, so this label reflects both genes.

Nilotinib

USE AS DIRECTED

Tasigna

Your body processes nilotinib at a normal rate. The standard dose should work as expected.

UGT1A1 Normal metabolizer

UGT1A1: Normal metabolizer

FDA DRUG LABEL, UGT1A1 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Pazopanib

USE AS DIRECTED

Votrient

Your body processes pazopanib at a normal rate. The standard dose should work as expected.

UGT1A1 Normal metabolizer

UGT1A1: Normal metabolizer

FDA DRUG LABEL, UGT1A1 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Sacituzumab Govitecan-Hziy

USE AS DIRECTED

Trodelvy

Your body processes sacituzumab govitecan at a normal rate. The standard dose should work as expected.

UGT1A1 Normal metabolizer

UGT1A1: Normal metabolizer

FDA DRUG LABEL, UGT1A1 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Thioguanine

USE AS DIRECTED

Lanvis, Tabloid

Both genes that affect this drug look normal, so a standard starting dose is expected.

TPMT Normal metabolizer **NUDT15** Normal metabolizer

TPMT: Normal metabolizer; **NUDT15:** Normal metabolizer

CPIC GUIDELINE, BOTH GENES TOGETHER USE AS DIRECTED Evidence: strong Read the guideline

WHAT IT MEANS Both TPMT and NUDT15 predict normal thiopurine metabolism and a normal risk of myelosuppression.

WHAT THE GUIDELINE SUGGESTS Initiate therapy with standard starting dose of thioguanine (e.g., 40 mg/m2/day for malignancy). During therapy, adjust the doses of myelosuppressive agents, as per standard clinical practice. It usually takes at least 2 weeks of stable dosing to reach steady state after each dose adjustment.

From the combined TPMT and NUDT15 table in CPIC's thiopurine guideline.

CPIC reads your TPMT and NUDT15 results together for thioguanine, so this label reflects both genes.

ESTROGEN MODULATORS

Tamoxifen

USE AS DIRECTED

Nolvadex, Soltamox

Your body turns this drug into its active form well. The usual dose should work.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

CPIC GUIDELINE, CYP2D6 USE AS DIRECTED Evidence: strong Read the guideline

WHAT IT MEANS Therapeutic endoxifen concentrations

WHAT THE GUIDELINE SUGGESTS Avoid moderate and strong CYP2D6 inhibitors. Initiate therapy with recommended standard of care dosing (tamoxifen 20 mg/day).

Immunosuppressants 4 medications

2 Use with caution 2 Use as directed

Abrocitinib

USE AS DIRECTED

Cibinqo

Your body may process this drug a little more slowly. The drug label has no special advice for this, so the usual dose is used.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 USE AS DIRECTED Evidence: moderate See the FDA table

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Abrocitinib - label recommended dosage and administration

Azathioprine

USE AS DIRECTED

Imuran

Both genes that affect this drug look normal, so a standard starting dose is expected.

TPMT Normal metabolizer **NUDT15** Normal metabolizer

TPMT: Normal metabolizer; **NUDT15:** Normal metabolizer

CPIC GUIDELINE, BOTH GENES TOGETHER USE AS DIRECTED Evidence: strong Read the guideline

WHAT IT MEANS Both TPMT and NUDT15 predict normal thiopurine metabolism and a normal risk of myelosuppression.

WHAT THE GUIDELINE SUGGESTS Initiate therapy with standard starting dose (e.g., 2 mg/kg/day for autoimmune diseases). During therapy, adjust doses of azathioprine based on disease-specific guidelines. It usually takes at least 2 weeks to reach steady state after each dose adjustment.

From the combined TPMT and NUDT15 table in CPIC's thiopurine guideline.

CPIC reads your TPMT and NUDT15 results together for azathioprine, so this label reflects both genes.

Siponimod

USE WITH CAUTION

Mayzent

Your body breaks down siponimod slower than normal, causing the drug to reach higher levels in your system. Your doctor will need to adjust your dose based on your specific genetic profile.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer

FDA DRUG LABEL, CYP2C9 USE WITH CAUTION See the FDA table

WHAT IT MEANS Results in higher systemic concentrations. Adjust dosage based on genotype. Refer to FDA labeling for specific dosing recommendations.

WHAT THE LABEL SUGGESTS Adjust the dosage based on genotype as the FDA label directs.

Tacrolimus

USE WITH CAUTION

Prograf

Your body breaks down this drug faster than many people do, so the usual dose may fall short. A higher starting dose and blood tests are advised.

CYP3A5 Intermediate metabolizer

CYP3A5: Intermediate metabolizer

CPIC GUIDELINE, CYP3A5 USE WITH CAUTION Evidence: strong Read the guideline

WHAT IT MEANS Lower dose-adjusted trough concentrations of tacrolimus and decreased chance of achieving target tacrolimus concentrations

WHAT THE GUIDELINE SUGGESTS Increase starting dose 1.5 to 2 times recommended starting dose. Total starting dose should not exceed 0.3mg/kg/day. Use therapeutic drug monitoring to guide dose adjustments

CYP3A5: Intermediate metabolizer

FDA DRUG LABEL, CYP3A5 USE WITH CAUTION See the FDA table

IN PLAIN WORDS Your body processes tacrolimus at a moderate rate. Your dose may need to be adjusted based on blood level monitoring to make sure you get the right amount.

WHAT IT MEANS Results in lower systemic concentrations, lower probability of achieving target concentrations and may result in higher rejection risk. Measure drug concentrations and adjust dosage based on trough whole blood tacrolimus concentrations.

WHAT THE LABEL SUGGESTS Measure drug concentrations and adjust the dosage based on trough whole blood tacrolimus concentrations.

Antivirals 5 medications

3 Consider alternative 1 Use as directed 1 Unable to determine

ANTIRETROVIRALS

Atazanavir

USE AS DIRECTED

Reyataz, Evotaz, Others

Your chance of getting yellow skin or eyes (jaundice) from this drug is very low.

UGT1A1 Normal metabolizer

UGT1A1: Normal metabolizer

CPIC GUIDELINE, UGT1A1 USE AS DIRECTED Evidence: strong Read the guideline

WHAT IT MEANS Reference UGT1A1 activity; very low likelihood of bilirubin-related discontinuation of atazanavir.

WHAT THE GUIDELINE SUGGESTS There is no need to avoid prescribing of atazanavir based on UGT1A1 genetic test result.

Efavirenz

UNABLE TO DETERMINE

Sustiva

The impact of your genotype on response to this drug is unknown

CYP2B6 Indeterminate

CYP2B6: Indeterminate

CPIC GUIDELINE, CYP2B6 UNABLE TO DETERMINE Read the guideline

WHAT IT MEANS No CPIC guidance for your genotype

WHAT THE GUIDELINE SUGGESTS A genotype-based dosing recommendation cannot be determined from this result.

CYP2B6: Indeterminate

FDA DRUG LABEL, CYP2B6 UNABLE TO DETERMINE See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS A genotype-based dosing recommendation cannot be determined from this result.

Peginterferon Alfa-2A

CONSIDER ALTERNATIVE

Pegasys

This hepatitis C drug is less likely to clear the virus for people with your genes. Your doctor may consider a different treatment.

CT **IFNL3** Unfavorable response genotype

IFNL3: Unfavorable response genotype

CPIC GUIDELINE, IFNL3 CONSIDER ALTERNATIVE Evidence: strong Read the guideline

WHAT IT MEANS Approximately 30% chance for sustained virologic response (SVR) after 48 weeks of treatment. Consider implications before initiating PEG-IFN alpha and RBV containing regimens.

WHAT THE GUIDELINE SUGGESTS Approximately 60% chance for SVR after 24-48 weeks of treatment. Approximately 50% of patients are eligible for shortened therapy (24-28 weeks). Consider implications before initiating PEG-IFN alpha and RBV containing regimens.

Peginterferon Alfa-2B

CONSIDER ALTERNATIVE

PegIntron

This hepatitis C drug is less likely to clear the virus for people with your genes. Your doctor may consider a different treatment.

CT **IFNL3** Unfavorable response genotype

IFNL3: Unfavorable response genotype

CPIC GUIDELINE, IFNL3 CONSIDER ALTERNATIVE Evidence: strong Read the guideline

WHAT IT MEANS Approximately 30% chance for sustained virologic response (SVR) after 48 weeks of treatment. Consider implications before initiating PEG-IFN alpha and RBV containing regimens.

WHAT THE GUIDELINE SUGGESTS Approximately 60% chance for SVR after 24-48 weeks of treatment. Approximately 50% of patients are eligible for shortened therapy (24-28 weeks). Consider implications before initiating PEG-IFN alpha and RBV containing regimens.

Ribavirin

CONSIDER ALTERNATIVE

Copegus, Rebetol, Virazole

This hepatitis C treatment is less likely to clear the virus for people with your genes. Your doctor may consider a different treatment.

IFNL3 Unfavorable response genotype

IFNL3: Unfavorable response genotype

CPIC GUIDELINE, IFNL3 — CONSIDER ALTERNATIVE — Evidence: strong — Read the guideline

WHAT IT MEANS Approximately 30% chance for sustained virologic response (SVR) after 48 weeks of treatment. Consider implications before initiating PEG-IFN alpha and RBV containing regimens.

WHAT THE GUIDELINE SUGGESTS Approximately 60% chance for SVR after 24-48 weeks of treatment. Approximately 50% of patients are eligible for shortened therapy (24-28 weeks). Consider implications before initiating PEG-IFN alpha and RBV containing regimens.

Antifungals 1 medication

1 Use with caution

Voriconazole

USE WITH CAUTION

Vfend

Your body breaks down this drug more slowly, so levels can rise and side effects are more likely.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

CPIC GUIDELINE, CYP2C19 — USE AS DIRECTED — Evidence: moderate — Read the guideline

IN PLAIN WORDS Your body breaks down this drug a bit more slowly, so levels may run a little higher. The usual dose is still advised.

WHAT IT MEANS Higher dose-adjusted trough concentrations of voriconazole compared to normal metabolizers.

WHAT THE GUIDELINE SUGGESTS Initiate therapy with recommended standard of care dosing.

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 — USE WITH CAUTION — Evidence: moderate — See the FDA table

WHAT IT MEANS Results in higher systemic concentrations and may result in higher adverse reaction risk.

WHAT THE LABEL SUGGESTS No specific dosing change in the FDA table. Refer to FDA labeling.

Anesthetics 8 medications

1 Use as directed 7 No known risk variants found

Desflurane

NO KNOWN RISK VARIANTS FOUND

We checked the known malignant hyperthermia genes in your DNA and found no listed risk variants. This doesn't rule out the risk: about half of people who have had this reaction carry no known variant. Tell your anesthesiologist about any personal or family history of reactions to anesthesia.

RYR1 No known risk variants found **CACNA1S** No known risk variants found

RYR1: No known risk variants found; **CACNA1S:** No known risk variants found

CPIC GUIDELINE, BOTH GENES TOGETHER NO KNOWN RISK VARIANTS FOUND Read the guideline

WHAT IT MEANS No known CPIC-listed malignant-hyperthermia-associated variants were identified in RYR1 or CACNA1S in the supplied WGS data. These results do not eliminate the chance that this patient is susceptible to malignant hyperthermia (MH). The genetic cause of about half of all MH survivors, with MH susceptibility confirmed by contracture test, remains unknown (PMID 28902675).

WHAT THE GUIDELINE SUGGESTS Clinical findings, family history, further genetic testing and other laboratory data should guide use of halogenated volatile anesthetics or depolarizing muscle relaxants.

CPIC reads your RYR1 and CACNA1S results together for desflurane, so this label reflects both genes.

Enflurane

NO KNOWN RISK VARIANTS FOUND

We checked the known malignant hyperthermia genes in your DNA and found no listed risk variants. This doesn't rule out the risk: about half of people who have had this reaction carry no known variant. Tell your anesthesiologist about any personal or family history of reactions to anesthesia.

RYR1 No known risk variants found **CACNA1S** No known risk variants found

RYR1: No known risk variants found; **CACNA1S:** No known risk variants found

CPIC GUIDELINE, BOTH GENES TOGETHER NO KNOWN RISK VARIANTS FOUND Read the guideline

WHAT IT MEANS No known CPIC-listed malignant-hyperthermia-associated variants were identified in RYR1 or CACNA1S in the supplied WGS data. These results do not eliminate the chance that this patient is susceptible to malignant hyperthermia (MH). The genetic cause of about half of all MH survivors, with MH susceptibility confirmed by contracture test, remains unknown (PMID 28902675).

WHAT THE GUIDELINE SUGGESTS Clinical findings, family history, further genetic testing and other laboratory data should guide use of halogenated volatile anesthetics or depolarizing muscle relaxants.

CPIC reads your RYR1 and CACNA1S results together for enflurane, so this label reflects both genes.

Halothane

NO KNOWN RISK VARIANTS FOUND

We checked the known malignant hyperthermia genes in your DNA and found no listed risk variants. This doesn't rule out the risk: about half of people who have had this reaction carry no known variant. Tell your anesthesiologist about any personal or family history of reactions to anesthesia.

RYR1 No known risk variants found **CACNA1S** No known risk variants found

RYR1: No known risk variants found; **CACNA1S:** No known risk variants found

CPIC GUIDELINE, BOTH GENES TOGETHER NO KNOWN RISK VARIANTS FOUND Read the guideline

WHAT IT MEANS No known CPIC-listed malignant-hyperthermia-associated variants were identified in RYR1 or CACNA1S in the supplied WGS data. These results do not eliminate the chance that this patient is susceptible to malignant hyperthermia (MH). The genetic cause of about half of all MH survivors, with MH susceptibility confirmed by contracture test, remains unknown (PMID 28902675).

WHAT THE GUIDELINE SUGGESTS Clinical findings, family history, further genetic testing and other laboratory data should guide use of halogenated volatile anesthetics or depolarizing muscle relaxants.

CPIC reads your RYR1 and CACNA1S results together for halothane, so this label reflects both genes.

Isoflurane

NO KNOWN RISK VARIANTS FOUND

We checked the known malignant hyperthermia genes in your DNA and found no listed risk variants. This doesn't rule out the risk: about half of people who have had this reaction carry no known variant. Tell your anesthesiologist about any personal or family history of reactions to anesthesia.

RYR1 No known risk variants found **CACNA1S** No known risk variants found

RYR1: No known risk variants found; **CACNA1S:** No known risk variants found

CPIC GUIDELINE, BOTH GENES TOGETHER NO KNOWN RISK VARIANTS FOUND Read the guideline

WHAT IT MEANS No known CPIC-listed malignant-hyperthermia-associated variants were identified in RYR1 or CACNA1S in the supplied WGS data. These results do not eliminate the chance that this patient is susceptible to malignant hyperthermia (MH). The genetic cause of about half of all MH survivors, with MH susceptibility confirmed by contracture test, remains unknown (PMID 28902675).

WHAT THE GUIDELINE SUGGESTS Clinical findings, family history, further genetic testing and other laboratory data should guide use of halogenated volatile anesthetics or depolarizing muscle relaxants.

CPIC reads your RYR1 and CACNA1S results together for isoflurane, so this label reflects both genes.

Methoxyflurane

NO KNOWN RISK VARIANTS FOUND

We checked the known malignant hyperthermia genes in your DNA and found no listed risk variants. This doesn't rule out the risk: about half of people who have had this reaction carry no known variant. Tell your anesthesiologist about any personal or family history of reactions to anesthesia.

RYR1 No known risk variants found **CACNA1S** No known risk variants found

RYR1: No known risk variants found; **CACNA1S:** No known risk variants found

CPIC GUIDELINE, BOTH GENES TOGETHER NO KNOWN RISK VARIANTS FOUND Read the guideline

WHAT IT MEANS No known CPIC-listed malignant-hyperthermia-associated variants were identified in RYR1 or CACNA1S in the supplied WGS data. These results do not eliminate the chance that this patient is susceptible to malignant hyperthermia (MH). The genetic cause of about half of all MH survivors, with MH susceptibility confirmed by contracture test, remains unknown (PMID 28902675).

WHAT THE GUIDELINE SUGGESTS Clinical findings, family history, further genetic testing and other laboratory data should guide use of halogenated volatile anesthetics or depolarizing muscle relaxants.

CPIC reads your RYR1 and CACNA1S results together for methoxyflurane, so this label reflects both genes.

Mivacurium

USE AS DIRECTED

Mivacron

Your body breaks down this drug normally. Your doctor can use the usual dose.

BCHE Normal metabolizer

BCHE: Normal metabolizer

FDA DRUG LABEL, BCHE USE AS DIRECTED Evidence: strong See the FDA table

WHAT IT MEANS Normal BCHE activity and expected metabolism of mivacurium.

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose and adjust per standard clinical practice.

Sevoflurane

NO KNOWN RISK VARIANTS FOUND

We checked the known malignant hyperthermia genes in your DNA and found no listed risk variants. This doesn't rule out the risk: about half of people who have had this reaction carry no known variant. Tell your anesthesiologist about any personal or family history of reactions to anesthesia.

RYR1 No known risk variants found **CACNA1S** No known risk variants found

RYR1: No known risk variants found; **CACNA1S:** No known risk variants found

CPIC GUIDELINE, BOTH GENES TOGETHER NO KNOWN RISK VARIANTS FOUND Read the guideline

WHAT IT MEANS No known CPIC-listed malignant-hyperthermia-associated variants were identified in RYR1 or CACNA1S in the supplied WGS data. These results do not eliminate the chance that this patient is susceptible to malignant hyperthermia (MH). The genetic cause of about half of all MH survivors, with MH susceptibility confirmed by contracture test, remains unknown (PMID 28902675).

WHAT THE GUIDELINE SUGGESTS Clinical findings, family history, further genetic testing and other laboratory data should guide use of halogenated volatile anesthetics or depolarizing muscle relaxants.

CPIC reads your RYR1 and CACNA1S results together for sevoflurane, so this label reflects both genes.

Succinylcholine

NO KNOWN RISK VARIANTS FOUND

Quelicin, Anectine

We checked the known malignant hyperthermia genes in your DNA and found no listed risk variants. This doesn't rule out the risk: about half of people who have had this reaction carry no known variant. Tell your anesthesiologist about any personal or family history of reactions to anesthesia.

RYR1 No known risk variants found **CACNA1S** No known risk variants found **BCHE** Normal metabolizer

RYR1: No known risk variants found; **CACNA1S:** No known risk variants found

CPIC GUIDELINE, BOTH GENES TOGETHER NO KNOWN RISK VARIANTS FOUND Read the guideline

WHAT IT MEANS No known CPIC-listed malignant-hyperthermia-associated variants were identified in RYR1 or CACNA1S in the supplied WGS data. These results do not eliminate the chance that this patient is susceptible to malignant hyperthermia (MH). The genetic cause of about half of all MH survivors, with MH susceptibility confirmed by contracture test, remains unknown (PMID 28902675).

WHAT THE GUIDELINE SUGGESTS Clinical findings, family history, further genetic testing and other laboratory data should guide use of halogenated volatile anesthetics or depolarizing muscle relaxants.

BCHE: Normal metabolizer

FDA DRUG LABEL, BCHE USE AS DIRECTED Evidence: strong See the FDA table

IN PLAIN WORDS Your body breaks down this drug normally. Your doctor can use the usual dose.

WHAT IT MEANS Normal BCHE activity and expected metabolism of succinylcholine.

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose and adjust per standard clinical practice.

CPIC reads your RYR1 and CACNA1S results together for succinylcholine, so this label reflects both genes.

Weight management 3 medications

3 Use as directed

Retatrutide

USE AS DIRECTED

You can expect average weight loss on this drug. Your genes also give the lowest chance of stomach side effects.

GLP1R Typical response **GIPR** Normal function

GLP1R: Typical response; **GIPR:** Normal function

GENE2RX RESEARCH SUMMARY, BOTH GENES TOGETHER USE AS DIRECTED Evidence: weak See the drug page

WHAT IT MEANS GLP1R: the more common Pro7/Pro7 form of the signal peptide (rs10305420 C/C). GIPR: full-function Glu354/Glu354 (rs1800437 G/G). This is the lowest-risk genotype pair for GI side effects. Expected weight-loss efficacy from the GLP1R arm of retatrutide. GIPR is full-function, so it adds no extra GI risk on retatrutide.

WHAT THE RESEARCH SUGGESTS Standard dosing and titration are expected to produce an average response.

Gene2Rx guideline extrapolated from the tirzepatide results in Su et al., Nature (2026). Retatrutide, an investigational GIP, GLP-1 and glucagon receptor agonist, has no genetic study of its own, so this assumes the GLP1R and GIPR variants act as they do with tirzepatide, which also acts on both receptors.

Gene2Rx reads your GLP1R and GIPR results together for retatrutide, so this label reflects both genes.

Semaglutide

USE AS DIRECTED

Ozempic, Wegovy

Your genes point to a typical response to this drug, with average weight loss and side effects.

GLP1R Typical response

GLP1R: Typical response

GENE2RX RESEARCH SUMMARY, GLP1R USE AS DIRECTED Evidence: moderate See the drug page

WHAT IT MEANS The Pro7/Pro7 form of the GLP1R signal peptide (rs10305420 C/C). The Leu7 (T) allele is the less common one in every ancestry group studied. Expected weight-loss efficacy and typical nausea/vomiting risk.

WHAT THE RESEARCH SUGGESTS Standard dosing and titration are expected to produce an average response.

Tirzepatide

USE AS DIRECTED

Mounjaro, Zepbound

Your genes point to typical weight loss on this drug, with the lowest chance of stomach side effects.

GLP1R Typical response **GIPR** Normal function

GLP1R: Typical response; **GIPR:** Normal function

GENE2RX RESEARCH SUMMARY, BOTH GENES TOGETHER USE AS DIRECTED Evidence: moderate See the drug page

WHAT IT MEANS GLP1R: the more common Pro7/Pro7 form of the signal peptide (rs10305420 C/C). GIPR: full-function Glu354/Glu354 (rs1800437 G/G). This is the lowest-risk genotype pair: estimated risk of moderate-to-severe vomiting on tirzepatide is about 2.5%, and nausea about 14%. Expected weight-loss efficacy from the GLP1R arm of tirzepatide. GIPR is full-function, so it adds no extra GI risk on tirzepatide.

WHAT THE RESEARCH SUGGESTS Standard dosing and titration are expected to produce an average response.

Gene2Rx guideline based on Su et al., Nature (2026), which linked GLP1R rs10305420 and GIPR rs1800437 to nausea and vomiting on tirzepatide. The GIPR effect was specific to tirzepatide and was not seen with semaglutide.

Gene2Rx reads your GLP1R and GIPR results together for tirzepatide, so this label reflects both genes.

Antidiabetics 1 medication

1 Use as directed

Nateglinide

USE AS DIRECTED

Starlix

Your body breaks down nateglinide slightly slower than normal. The standard dose should work as expected.

CYP2C9 Intermediate metabolizer

CYP2C9: Intermediate metabolizer

FDA DRUG LABEL, CYP2C9 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for this phenotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Antihistamines 1 medication

1 Use with caution

Meclizine

USE WITH CAUTION

Antivert

Your body processes meclizine faster than normal, which may affect how well the medication works. Your doctor should monitor you for side effects and whether the drug is effective.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE WITH CAUTION See the FDA table

WHAT IT MEANS May affect systemic concentrations. Monitor for adverse reactions and clinical effect.

WHAT THE LABEL SUGGESTS Monitor for adverse reactions and clinical effect.

Drugs used in addictive disorders 1 medication

1 Use as directed

Lofexidine

USE AS DIRECTED

Lucemyra

Your CYP2D6 result means higher CYP2D6 activity than usual, but the FDA gives no genetic dosing change for lofexidine at this result.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Female sexual health 1 medication

1 Use as directed

Flibanserin

USE AS DIRECTED

Addyi

Your CYP2C19 result means somewhat lower CYP2C19 activity than usual, but the FDA gives no genetic dosing change for flibanserin at this result.

CYP2C19 Intermediate metabolizer

CYP2C19: Intermediate metabolizer

FDA DRUG LABEL, CYP2C19 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Gaucher's disease treatments 1 medication

1 Use with caution

Eliglustat

USE WITH CAUTION

Cerdelga

Your body breaks down eliglustat too quickly, which may prevent the drug from reaching levels needed to be effective. Your doctor may need to consider alternative dosing or treatment.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE WITH CAUTION See the FDA table

WHAT IT MEANS Ultrarapid metabolizers may not achieve adequate concentrations to achieve a therapeutic effect.

WHAT THE LABEL SUGGESTS Eliglustat is indicated for normal, intermediate and poor metabolizers; ultrarapid metabolizers may not reach adequate concentrations.

Gout 1 medication

1 Use as directed

Allopurinol

USE AS DIRECTED

Zyloprim

Your ABCG2 genotype does not change how you respond to allopurinol; standard dosing applies.

ABCG2 Normal function

ABCG2: Normal function

DPWG GUIDELINE, ABCG2 USE AS DIRECTED Evidence: moderate Read the guideline

WHAT IT MEANS Normal ABCG2 transporter function. Renal and intestinal uric acid excretion is not impaired by ABCG2 variation at p.Gln141Lys.

WHAT THE GUIDELINE SUGGESTS Use standard allopurinol dosing.

Hair loss 1 medication

1 Use with caution

Minoxidil

USE WITH CAUTION

Rogaine

You may turn less minoxidil into its active form, so it may regrow less hair. It can still help. If results are poor, ask your doctor about other options.

SULT1A1 Decreased function

SULT1A1: Decreased function

GENE2RX RESEARCH SUMMARY, SULT1A1 USE WITH CAUTION Evidence: weak See the drug page

WHAT IT MEANS Your SULT1A1 result suggests reduced enzyme function. This enzyme helps activate topical minoxidil (Rogaine). Reduced activation may limit hair regrowth, even with consistent use. This result does not rule out benefit from treatment.

WHAT THE RESEARCH SUGGESTS If hair growth is limited despite consistent use, discuss additional or alternative treatments with your clinician.

Saliva production stimulators 1 medication

1 Use as directed

Cevimeline

USE AS DIRECTED

Evoxac

Your body processes this drug faster than usual. The FDA has no special advice for this, so the usual dose is used.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Urologicals 1 medication

1 Use as directed

Tolterodine

USE AS DIRECTED

Detrol

Your CYP2D6 result means higher CYP2D6 activity than usual, but the FDA gives no genetic dosing change for tolterodine at this result.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

FDA DRUG LABEL, CYP2D6 USE AS DIRECTED See the FDA table

WHAT IT MEANS No FDA guidance for your genotype

WHAT THE LABEL SUGGESTS Initiate therapy with recommended starting dose.

Other substances 7 medications

3 Use with caution 3 Use as directed 1 Unable to determine

Alcohol

USE AS DIRECTED

Your genes have little effect on how your body handles alcohol.

ADH1B Normal function **ALDH2** Normal function

ADH1B: Normal function

GENE2RX RESEARCH SUMMARY, ADH1B USE AS DIRECTED See the drug page

WHAT IT MEANS Two Arg48 alleles (rs1229984). Usual rate of ethanol oxidation. Compared with His48 carriers, associated with higher risk of alcohol dependence and, among heavy drinkers in East Asian studies, higher risk of esophageal and head and neck cancer. Only rs1229984 is assessed: ADH1B*3 (rs2066702), common in people of African ancestry, is not read, so its carriers are reported here.

WHAT THE RESEARCH SUGGESTS Follow standard guidelines for alcohol consumption.

ALDH2: Normal function

GENE2RX RESEARCH SUMMARY, ALDH2 USE AS DIRECTED See the drug page

IN PLAIN WORDS Your genes have little effect on how you clear the toxic by-product of alcohol.

WHAT IT MEANS Two Glu504 alleles (rs671 G/G, ALDH2*1/*1). Normal acetaldehyde clearance; typical risk of flushing, hangover and alcohol dependence for this gene.

WHAT THE RESEARCH SUGGESTS Standard advice on drinking limits.

Caffeine

USE AS DIRECTED

Coffee, Tea

Your body clears caffeine at an expected rate. The usual advice on caffeine limits applies.

CYP1A2 Normal metabolizer

CYP1A2: Normal metabolizer

GENE2RX RESEARCH SUMMARY, CYP1A2 USE AS DIRECTED See the drug page

WHAT IT MEANS No rs762551 A allele and no F186L allele (*1/*1), or one of each. Expected caffeine clearance. Note: in the coffee and cardiovascular literature, C/C is classed as a 'slow' metabolizer genotype.

WHAT THE RESEARCH SUGGESTS Follow standard moderate intake guidance (up to 400 mg a day for most adults).

Ketamine

UNABLE TO DETERMINE

Ketalar

We cannot tell from this result how your genetics affect ketamine clearance.

CYP2B6 Indeterminate

CYP2B6: Indeterminate

GENE2RX RESEARCH SUMMARY, CYP2B6 UNABLE TO DETERMINE See the drug page

WHAT IT MEANS The alleles detected cannot be assigned a CYP2B6 function, so no phenotype can be inferred.

WHAT THE RESEARCH SUGGESTS A genotype-based dosing recommendation cannot be determined from this result.

LSD

USE AS DIRECTED

Acid

Your result suggests faster clearance of LSD, but no research has looked at this group.

CYP2D6 Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

GENE2RX RESEARCH SUMMARY, CYP2D6 USE AS DIRECTED See the drug page

WHAT IT MEANS Increased CYP2D6 activity, so faster LSD clearance is expected. The pooled clinical analysis compared participants with no functional CYP2D6 against carriers of functional CYP2D6 and did not examine ultrarapid metabolizers separately. This result cannot be produced from uploaded data, because increased-function CYP2D6 alleles are gene duplications, which are not detected.

WHAT THE RESEARCH SUGGESTS No genotype-based adjustment. Monitor participant-reported experiential responses.

MDMA

USE WITH CAUTION

Ecstasy

Your genotype has been linked to more dizziness, anxiety and sedation after MDMA, and to a larger drop in blood sodium.

COMT Decreased function **CYP2D6** Ultrarapid metabolizer

COMT: Decreased function

GENE2RX RESEARCH SUMMARY, COMT USE WITH CAUTION Evidence: weak See the drug page

WHAT IT MEANS Two rs4680 A alleles (Met158/Met158), the lower-activity form. In a controlled study, lower-activity COMT genotypes were associated with more negative subjective effects after MDMA, specifically dizziness, anxiety and sedation. In a field study of clubbers, low-activity COMT genotypes were associated with larger falls in plasma sodium and osmolality, the mechanism behind MDMA-related dilutional hyponatraemia.

WHAT THE RESEARCH SUGGESTS If exposure occurs, monitor neurological and cardiovascular status and fluid intake. Both supporting studies are small and unreplicated.

MDMA

USE WITH CAUTION

Ecstasy

Your genotype has been linked to more dizziness, anxiety and sedation after MDMA, and to a larger drop in blood sodium.

COMT Decreased function **CYP2D6** Ultrarapid metabolizer

CYP2D6: Ultrarapid metabolizer

GENE2RX RESEARCH SUMMARY, CYP2D6 USE AS DIRECTED See the drug page

IN PLAIN WORDS You may clear this drug faster than average. No dose change is suggested for your result.

WHAT IT MEANS Increased CYP2D6 activity, so faster O-demethylenation of MDMA is expected. No study has examined MDMA in ultrarapid metabolizers. This result cannot be produced from uploaded consumer array or sequencing data, because increased-function CYP2D6 alleles are gene duplications, which are not detected.

WHAT THE RESEARCH SUGGESTS No genotype-based adjustment. MDMA has no approved medical use; if exposure occurs, monitor body temperature, blood pressure and neurological status.

Nicotine

USE WITH CAUTION

Cigarettes, Zyn

This result has been studied in relation to smoking, but the findings are mixed. Some studies found people with it did better when quitting with nicotine replacement.

G G **CHRNA5** Normal function **COMT** Decreased function **CYP2A6** Intermediate metabolizer

CHRNA5: Normal function

GENE2RX RESEARCH SUMMARY, CHRNA5 USE AS DIRECTED See the drug page

IN PLAIN WORDS Your genes give you a typical risk of becoming hooked on nicotine.

WHAT IT MEANS rs16969968 G/G (Asp398/Asp398). No added risk of heavier smoking or delayed cessation from this variant.

WHAT THE RESEARCH SUGGESTS Typical response to nicotine. Standard cessation counseling and pharmacotherapy as indicated.

COMT: Decreased function

GENE2RX RESEARCH SUMMARY, COMT USE WITH CAUTION Evidence: weak See the drug page

WHAT IT MEANS rs4680 Met/Met. Lowest COMT activity (Met is described as having 3 to 4 times lower activity than Val). Some studies associate Met/Met with better quitting on nicotine replacement and others find weak or no association with smoking heaviness or cessation.

WHAT THE RESEARCH SUGGESTS No reliable genotype-based change to cessation treatment; standard counseling and pharmacotherapy.

Nicotine

USE WITH CAUTION

Cigarettes, Zyn

This result has been studied in relation to smoking, but the findings are mixed. Some studies found people with it did better when quitting with nicotine replacement.

CHRNA5 Normal function **COMT** Decreased function **CYP2A6** Intermediate metabolizer

CYP2A6: Intermediate metabolizer

GENE2RX RESEARCH SUMMARY, CYP2A6 USE AS DIRECTED Evidence: moderate See the drug page

IN PLAIN WORDS You clear nicotine a little more slowly than average.

WHAT IT MEANS One reduced-function allele. Nicotine clearance is moderately reduced, giving modestly higher and longer-lasting nicotine levels; reduced CYP2A6 function is associated with smoking fewer cigarettes per day.

WHAT THE RESEARCH SUGGESTS Nicotine remains in circulation longer; no change to standard cessation treatment is needed on the basis of this result.

THC

USE WITH CAUTION

Cannabis, Marijuana

You make less of the enzyme that clears your body's own cannabinoids. What this means for how THC affects you is not settled by the research so far.

AKT1 Normal function **COMT** Decreased function **CYP2C9** Intermediate metabolizer **FAAH** Decreased function

AKT1: Normal function

GENE2RX RESEARCH SUMMARY, AKT1 USE AS DIRECTED Evidence: moderate See the drug page

IN PLAIN WORDS This gene does not raise your risk of paranoid thoughts from THC. Your risk is typical.

WHAT IT MEANS Two rs2494732 T alleles. In the gene-environment studies of cannabis and psychosis, this genotype showed no excess of psychotic-like effects.

WHAT THE RESEARCH SUGGESTS No AKT1-based adjustment. The usual risk of transient psychotic-like effects from THC applies.

COMT: Decreased function

GENE2RX RESEARCH SUMMARY, COMT USE AS DIRECTED Evidence: weak See the drug page

IN PLAIN WORDS This result has been described as buffering some effects of cannabis, but other studies found the opposite, so it should not be read as protection.

WHAT IT MEANS Two rs4680 A alleles (Met158/Met158). Lower COMT activity and higher baseline prefrontal dopamine. Whether this reduces the psychotomimetic response to THC is unresolved: a meta-analysis of gene-environment studies found the interaction significant only in case-only designs, where Met/Met was the risk genotype, and a pooled analysis of placebo-controlled THC studies found the strongest dysphoric reactions in Met/Met participants.

WHAT THE RESEARCH SUGGESTS No COMT-based adjustment. Monitor for unexpected reactions; this genotype should not be interpreted as protective.

THC

USE WITH CAUTION

Cannabis, Marijuana

You make less of the enzyme that clears your body's own cannabinoids. What this means for how THC affects you is not settled by the research so far.

AKT1 Normal function **COMT** Decreased function **CYP2C9** Intermediate metabolizer **FAAH** Decreased function

CYP2C9: Intermediate metabolizer (activity score 1.5)

GENE2RX RESEARCH SUMMARY, CYP2C9 USE AS DIRECTED Evidence: weak See the drug page

IN PLAIN WORDS Your body may break down THC slightly more slowly than average, so effects could feel a little stronger or last a little longer.

WHAT IT MEANS Activity score 1.5 (one decreased-function allele, usually *2). Slightly reduced hydroxylation of THC. In the only published pharmacokinetic study of oral THC by CYP2C9 genotype, *2 status alone did not change THC exposure, so any increase at this activity score is expected to be small.

WHAT THE RESEARCH SUGGESTS Initiate at standard doses. Monitor for increased sedation or psychotropic intensity.

FAAH: Decreased function

GENE2RX RESEARCH SUMMARY, FAAH USE WITH CAUTION Evidence: weak See the drug page

WHAT IT MEANS One or two rs324420 A alleles (Pro129Thr). The variant protein is catalytically normal but less stable, and homozygous carriers have under half the usual FAAH protein and activity; brain imaging shows lower FAAH binding in A-allele carriers. Baseline anandamide tone is therefore higher. The consequences for cannabis are unresolved: the variant was associated with problem drug use in the original reports, but in cannabis-specific studies A/A carriers were less likely to be THC dependent and C/C carriers reported more craving after abstinence.

WHAT THE RESEARCH SUGGESTS No reliable FAAH-based dose adjustment can be given. If THC is used, monitor for unusually intense subjective effects or craving.

Gene details and frequencies

All 30 genes. Frequency context describes populations, not your chance of a side effect. A missing frequency estimate means no supported reference is available for that result.

ABCG2 Normal function

rs2231142G/rs2231142G · Both copies work normally.

A pump that clears uric acid and some drugs, such as rosuvastatin, from the body.

2 medications list this gene. Guidance unchanged

ABCG2 normal function: estimated in 48.0% to 98.8% of people across population groups

These CPIC estimates describe this phenotype, not your exact DNA combination or your chance of side effects. Frequencies vary by population; no ancestry is assumed for you.

African American/Afro-Caribbean	**93.1%**	American	**64.0%**
Central/South Asian	**82.2%**	East Asian	**48.0%**
European	**80.4%**	Latino	**60.2%**
Near Eastern	**87.4%**	Oceanian	**63.2%**
Sub-Saharan African	**98.8%**		

Estimated from published allele frequencies, rather than a direct count of people with this result. Study coverage and methods vary. Reference: CPIC ABCG2 frequency table and methods. Data retrieved 2026-10-17.

ADH1B Normal function

rs1229984C/rs1229984C · Both copies work normally.

Turns alcohol into acetaldehyde, a toxic by-product.

1 medication lists this gene. Guidance unchanged

ADH1B rs1229984 C allele: 29.6% to 99.7% of DNA copies across ancestry groups

Your result has 2 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the C allele / total DNA copies measured.

African / African American	**98.8%** 41,031 / 41,534	Admixed American	**93.2%** 14,240 / 15,282
Amish	**89.9%** 820 / 912	Ashkenazi Jewish	**73.1%** 2,539 / 3,472
East Asian	**29.6%** 1,530 / 5,168	Finnish	**99.7%** 10,586 / 10,618
Middle Eastern	**78.6%** 231 / 294	European (non-Finnish)	**96.4%** 65,617 / 68,036
South Asian	**95.9%** 4,626 / 4,822	Remaining ancestry group	**88.4%** 1,861 / 2,106

Reference: gnomAD v4.1 genomes, GRCh38 4-99318162-T-C. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

AKT1 Normal function

rs2494732T/rs2494732T

A signaling gene linked to the risk of psychosis with heavy cannabis use.

You don't carry the variant linked to bad reactions to cannabis.

1 medication lists this gene. Guidance unchanged

AKT1 rs2494732 C allele: 33.2% to 72.2% of DNA copies across ancestry groups

Your result has 0 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the C allele / total DNA copies measured.

African / African American	**49.2%** 20,373 / 41,440	Admixed American	**55.2%** 8,437 / 15,284
Amish	**33.2%** 303 / 912	Ashkenazi Jewish	**42.2%** 1,464 / 3,466
East Asian	**72.2%** 3,713 / 5,144	Finnish	**43.7%** 4,616 / 10,572
Middle Eastern	**44.2%** 130 / 294	European (non-Finnish)	**43.3%** 29,377 / 67,904
South Asian	**59.8%** 2,887 / 4,824	Remaining ancestry group	**47.3%** 998 / 2,110

Reference: gnomAD v4.1 genomes, GRCh38 14-104772855-T-C. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

ALDH2 Normal function

rs671G/rs671G · Both copies work normally.

Clears acetaldehyde, the toxic by-product of alcohol.

1 medication lists this gene. Guidance unchanged

ALDH2 rs671 A allele: 0% to 22.5% of DNA copies across ancestry groups

Your result has 0 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the A allele / total DNA copies measured.

African / African American	**<0.1%** 8 / 41,546	Admixed American	**<0.1%** 14 / 15,274
Amish	**0%** 0 / 912	Ashkenazi Jewish	**0%** 0 / 3,470
East Asian	**22.5%** 1,154 / 5,132	Finnish	**<0.1%** 1 / 10,598
Middle Eastern	**0%** 0 / 294	European (non-Finnish)	**<0.1%** 2 / 68,020
South Asian	**<0.1%** 4 / 4,820	Remaining ancestry group	**0.5%** 10 / 2,108

Reference: gnomAD v4.1 genomes, GRCh38 12-111803962-G-A. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

BCHE Normal metabolizer

Reference/Reference · Both copies work normally.

Breaks down two muscle relaxers used in surgery. These are succinylcholine and mivacurium.

2 medications list this gene. Guidance unchanged

CACNA1S No known risk variants found

Reference/Reference

A muscle channel. Rare changes in it can cause a dangerous reaction to some anesthetics.

We checked and found no listed risk variant. That doesn't rule out the risk.

7 medications list this gene. Guidance unchanged

CHRNA5 Normal function

G G **rs16969968G/rs16969968G**

A nicotine receptor in the brain linked to heavy smoking.

You don't carry the variant linked to heavier smoking.

1 medication lists this gene. Guidance unchanged

CHRNA5 rs16969968 A allele: 3.2% to 40.7% of DNA copies across ancestry groups

Your result has 0 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the A allele / total DNA copies measured.

African / African American	**5.9%** 2,458 / 41,526	Admixed American	**22.6%** 3,458 / 15,290
Amish	**40.7%** 368 / 904	Ashkenazi Jewish	**37.5%** 1,302 / 3,470
East Asian	**3.2%** 166 / 5,186	Finnish	**32.7%** 3,455 / 10,568
Middle Eastern	**40.1%** 118 / 294	European (non-Finnish)	**34.7%** 23,587 / 67,982
South Asian	**22.2%** 1,069 / 4,826	Remaining ancestry group	**27.5%** 581 / 2,112

Reference: gnomAD v4.1 genomes, GRCh38 15-78590583-G-A. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

COMT Decreased function

 **rs4680A/rs4680A** · Both copies work less well.

Breaks down dopamine and other brain chemicals.

3 medications list this gene. Changes the guidance for 2

COMT rs4680 A allele: 27.4% to 66.4% of DNA copies across ancestry groups

Your result has 2 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the A allele / total DNA copies measured.

African / African American	**31.0%** 12,853 / 41,484	Admixed American	**40.4%** 6,184 / 15,292
Amish	**66.4%** 604 / 910	Ashkenazi Jewish	**45.3%** 1,571 / 3,466
East Asian	**27.4%** 1,414 / 5,152	Finnish	**55.3%** 5,854 / 10,592
Middle Eastern	**46.9%** 138 / 294	European (non-Finnish)	**51.8%** 35,191 / 67,942
South Asian	**44.5%** 2,147 / 4,822	Remaining ancestry group	**41.8%** 883 / 2,110

Reference: gnomAD v4.1 genomes, GRCh38 22-19963748-G-A. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

CYP1A2 Normal metabolizer

 ***1/*1** · Both copies work normally.

Breaks down caffeine and some medicines, such as clozapine.

1 medication lists this gene. Guidance unchanged

CYP2A6 Intermediate metabolizer

 ***1/*17** · One copy works and one works less well.

Breaks down nicotine.

1 medication lists this gene. Guidance unchanged

CYP2B6 Unable to determine

 ***18+Unknown/*9** · One copy (*9) works less well. The other (*18) also carries a variant that doesn't match any known version of the gene. So we can't say how well CYP2B6 works overall.

Breaks down efavirenz, ketamine, methadone and some drugs for depression.

3 medications list this gene. 2 shown as "Unable to determine"

CYP2C19 Intermediate metabolizer



***1/*2** · One copy works and one doesn't.

Handles several SSRIs, acid reducers such as omeprazole, and the blood thinner clopidogrel.

21 medications list this gene. Changes the guidance for 17

CYP2C19 intermediate metabolizer: estimated in 19.0% to 45.9% of people across population groups

These CPIC estimates describe this phenotype, not your exact DNA combination or your chance of side effects. Frequencies vary by population; no ancestry is assumed for you.

African American/Afro-Caribbean	**31.4%**	American	**21.4%**
Central/South Asian	**40.8%**	East Asian	**45.9%**
European	**26.1%**	Latino	**19.0%**
Near Eastern	**23.5%**	Oceanian	**36.9%**
Sub-Saharan African	**29.9%**		

Estimated from published allele frequencies, rather than a direct count of people with this result. Study coverage and methods vary. Reference: CPIC CYP2C19 frequency table and methods. Data retrieved 2026-10-17.

CYP2C9 Intermediate metabolizer



***1/*8** · One copy works and one works less well.

Clears warfarin, phenytoin, celecoxib and some other pain relievers.

Activity score: **1.5**. Typical range: 2.

16 medications list this gene. Changes the guidance for 8

CYP2C9 intermediate metabolizer: estimated in 8.7% to 36.2% of people across population groups

These CPIC estimates describe this phenotype, not your exact DNA combination or your chance of side effects. Frequencies vary by population; no ancestry is assumed for you.

African American/Afro-Caribbean	**23.6%**	American	**16.4%**
Central/South Asian	**36.2%**	East Asian	**15.2%**
European	**34.5%**	Latino	**24.6%**
Near Eastern	**35.9%**	Oceanian	**8.7%**
Sub-Saharan African	**26.3%**		

Estimated from published allele frequencies, rather than a direct count of people with this result. Study coverage and methods vary. Reference: CPIC CYP2C9 frequency table and methods. Data retrieved 2026-10-17.

CYP2D6 Ultrarapid metabolizer



***2/*2x2** · One copy works normally and one works faster than usual.

Turns on or clears about 1 in 4 prescription drugs. These include many drugs for depression, pain and ADHD.

Activity score: **3.0**. Typical range: 1.25 to 2.25.

47 medications list this gene. Changes the guidance for 19

CYP2D6 ultrarapid metabolizer: estimated in 0.9% to 17.8% of people across population groups

These CPIC estimates describe this phenotype, not your exact DNA combination or your chance of side effects. Frequencies vary by population; no ancestry is assumed for you.

African American/Afro-Caribbean	**4.1%**	American	**5.2%**
Central/South Asian	**1.5%**	East Asian	**0.9%**
European	**2.3%**	Latino	**4.1%**
Near Eastern	**7.4%**	Oceanian	**17.8%**
Sub-Saharan African	**4.5%**		

Estimated from published allele frequencies, rather than a direct count of people with this result. Study coverage and methods vary. Reference: CPIC CYP2D6 frequency table and methods. Data retrieved 2026-10-17.

CYP3A4 Unable to determine



***1/*15** · One copy (*1) works normally. The other (*15) has uncertain function: research hasn't yet shown how well it works. So we can't say how well CYP3A4 works overall.

Breaks down more prescription drugs than any other enzyme.

1 medication lists this gene. Shown as "Unable to determine"

CYP3A5 Intermediate metabolizer



***1/*6** · One copy works and one doesn't.

Breaks down tacrolimus, a drug used after organ transplants.

1 medication lists this gene. Changes the guidance for 1

CYP3A5 intermediate metabolizer: estimated in 13.7% to 49.9% of people across population groups

These CPIC estimates describe this phenotype, not your exact DNA combination or your chance of side effects. Frequencies vary by population; no ancestry is assumed for you.

African American/Afro-Caribbean	**49.6%**	Central/South Asian	**44.0%**
East Asian	**37.9%**	European	**13.7%**
Latino	**28.6%**	Near Eastern	**21.4%**
Sub-Saharan African	**49.9%**		

Estimated from published allele frequencies, rather than a direct count of people with this result. Study coverage and methods vary. Reference: CPIC CYP3A5 frequency table and methods. Data retrieved 2026-10-17.

CYP4F2 Unable to determine



***1/*2** · One copy (*1) works normally. The other (*2) has unknown function: research hasn't yet shown how well it works. So we can't say how well CYP4F2 works overall.

Clears extra vitamin K from the body, which changes how much warfarin you need.

DPYD Normal metabolizer



Reference/Reference · Both copies work normally.

Breaks down the cancer drugs fluorouracil and capecitabine.

Activity score: **2.0**. Typical range: 2.

2 medications list this gene. Guidance unchanged

FAAH Decreased function



rs324420A/rs324420A · Both copies work less well.

Breaks down chemicals your body makes that act like cannabis.

1 medication lists this gene. Changes the guidance for 1

FAAH rs324420 A allele: 14.5% to 35.9% of DNA copies across ancestry groups

Your result has 2 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the A allele / total DNA copies measured.

African / African American	**35.9%** 14,873 / 41,480	Admixed American	**30.4%** 4,643 / 15,292
Amish	**14.5%** 132 / 910	Ashkenazi Jewish	**14.7%** 509 / 3,470
East Asian	**17.6%** 910 / 5,176	Finnish	**27.8%** 2,946 / 10,584
Middle Eastern	**15.1%** 44 / 292	European (non-Finnish)	**20.7%** 14,044 / 67,986
South Asian	**19.6%** 946 / 4,826	Remaining ancestry group	**23.9%** 506 / 2,116

Reference: gnomAD v4.1 genomes, GRCh38 1-46405089-C-A. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

GIPR Normal function

rs1800437G/rs1800437G · Both copies work normally.

A gut-hormone receptor that tirzepatide and retatrutide act on.

2 medications list this gene. Guidance unchanged

GIPR rs1800437 C allele: 11.5% to 29.5% of DNA copies across ancestry groups

Your result has 0 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the C allele / total DNA copies measured.

African / African American	**11.5%** 4,770 / 41,492	Admixed American	**13.2%** 2,018 / 15,286
Amish	**11.6%** 106 / 910	Ashkenazi Jewish	**29.5%** 1,022 / 3,470
East Asian	**19.9%** 1,021 / 5,142	Finnish	**22.8%** 2,405 / 10,570
Middle Eastern	**16.0%** 47 / 294	European (non-Finnish)	**20.6%** 14,004 / 67,974
South Asian	**15.1%** 726 / 4,818	Remaining ancestry group	**19.8%** 417 / 2,110

Reference: gnomAD v4.1 genomes, GRCh38 19-45678134-G-C. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

GLP1R Typical response



rs10305420C/rs10305420C

The receptor that semaglutide and other GLP-1 drugs act on.

You have the most common form of this receptor, so GLP-1 drugs should work as expected.

3 medications list this gene. Guidance unchanged

GLP1R rs10305420 T allele: 7.7% to 39.8% of DNA copies across ancestry groups

Your result has 0 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the T allele / total DNA copies measured.

African / African American	**7.7%** 3,208 / 41,572	Admixed American	**29.9%** 4,573 / 15,294
Amish	**26.2%** 239 / 912	Ashkenazi Jewish	**36.9%** 1,279 / 3,470
East Asian	**14.4%** 740 / 5,154	Finnish	**39.8%** 4,217 / 10,590
Middle Eastern	**36.3%** 106 / 292	European (non-Finnish)	**38.2%** 25,971 / 67,946
South Asian	**19.2%** 926 / 4,830	Remaining ancestry group	**28.4%** 601 / 2,114

Reference: gnomAD v4.1 genomes, GRCh38 6-39048860-C-T. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

IFNL3 Unfavorable response genotype



rs12979860C/rs12979860T

An immune gene that affects how well hepatitis C treatment works.

Hepatitis C treatment with peginterferon is less likely to work for you.

3 medications list this gene. Changes the guidance for 3

IFNL3 rs12979860 T allele: 7.1% to 60.3% of DNA copies across ancestry groups

Your result has 1 copy of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the T allele / total DNA copies measured.

African / African American	**60.3%** 25,033 / 41,510	Admixed American	**37.4%** 5,725 / 15,292
Amish	**36.9%** 332 / 900	Ashkenazi Jewish	**39.4%** 1,369 / 3,472
East Asian	**7.1%** 369 / 5,176	Finnish	**24.1%** 2,553 / 10,600
Middle Eastern	**38.1%** 112 / 294	European (non-Finnish)	**31.5%** 21,409 / 67,956
South Asian	**22.7%** 1,094 / 4,828	Remaining ancestry group	**36.3%** 767 / 2,114

Reference: gnomAD v4.1 genomes, GRCh38 19-39248147-C-T. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

NAT2 Intermediate metabolizer



***4/*5** · One copy works faster than usual and one works less well.

Breaks down hydralazine, isoniazid and some other drugs.

1 medication lists this gene. Changes the guidance for 1

NUDT15 Normal metabolizer



***1/*1** · Both copies work normally.

Breaks down the active form of thiopurines such as azathioprine.

3 medications list this gene. Guidance unchanged

NUDT15 normal metabolizer: estimated in 79.2% to 98.6% of people across population groups

These CPIC estimates describe this phenotype, not your exact DNA combination or your chance of side effects. Frequencies vary by population; no ancestry is assumed for you.

Central/South Asian	**86.6%**	East Asian	**79.2%**
European	**98.6%**	Latino	**87.7%**

Estimated from published allele frequencies, rather than a direct count of people with this result. Study coverage and methods vary. Reference: CPIC NUDT15 frequency table and methods. Data retrieved 2026-10-17.

RYR1 No known risk variants found

Reference/Reference

A muscle channel. Rare changes in it can cause a dangerous reaction to some anesthetics.

We checked and found no listed risk variant. That doesn't rule out the risk.

7 medications list this gene. Guidance unchanged

SLCO1B1 Decreased function



***31/*37** · One copy works and one doesn't.

Moves statins into the liver.

7 medications list this gene. Changes the guidance for 6

SLCO1B1 decreased function: estimated in 0% to 36.5% of people across population groups

These CPIC estimates describe this phenotype, not your exact DNA combination or your chance of side effects. Frequencies vary by population; no ancestry is assumed for you.

African American/Afro-Caribbean	**2.0%**	American	**36.5%**
Central/South Asian	**13.0%**	East Asian	**21.8%**
European	**28.3%**	Near Eastern	**32.0%**
Oceanian	**0%**	Sub-Saharan African	**5.4%**

Estimated from published allele frequencies, rather than a direct count of people with this result. Study coverage and methods vary. Reference: CPIC SLCO1B1 frequency table and methods. Data retrieved 2026-10-17.

SULT1A1 Decreased function



***1/*2** · One copy works and one works less well.

Turns topical minoxidil into its active form in the scalp.

1 medication lists this gene. Changes the guidance for 1

TPMT Normal metabolizer



***1/*1** · Both copies work normally.

Breaks down thiopurines such as azathioprine and mercaptopurine.

3 medications list this gene. Guidance unchanged

TPMT normal metabolizer: estimated in 86.5% to 96.3% of people across population groups

These CPIC estimates describe this phenotype, not your exact DNA combination or your chance of side effects. Frequencies vary by population; no ancestry is assumed for you.

African American/Afro-Caribbean	**86.5%**	Central/South Asian	**96.3%**
East Asian	**96.0%**	European	**90.9%**
Latino	**89.2%**	Near Eastern	**93.2%**
Sub-Saharan African	**89.3%**		

Estimated from published allele frequencies, rather than a direct count of people with this result. Study coverage and methods vary. Reference: CPIC TPMT frequency table and methods. Data retrieved 2026-10-17.

UGT1A1 Normal metabolizer



***1/*60** · Both copies work normally.

Clears bilirubin and some drugs, such as the cancer drug irinotecan.

6 medications list this gene. Guidance unchanged

VKORC1 Normal expression



-1639G/-1639G

Recycles vitamin K and is the protein warfarin blocks.

You make a typical amount of the protein warfarin blocks.

1 medication lists this gene. Guidance unchanged

VKORC1 rs9923231 -1639A allele: 10.0% to 89.2% of DNA copies across ancestry groups

Your result has 0 copies of this allele. These gnomAD frequencies count DNA copies, not people who share your genotype or phenotype, and do not measure your chance of side effects. No ancestry is assumed for you.

Counts below show copies of the -1639A allele / total DNA copies measured.

African / African American	**10.0%** 4,141 / 41,504	Admixed American	**39.1%** 5,974 / 15,262
Amish	**44.2%** 400 / 906	Ashkenazi Jewish	**49.9%** 1,734 / 3,472
East Asian	**89.2%** 4,612 / 5,172	Finnish	**39.1%** 4,127 / 10,558
Middle Eastern	**53.4%** 156 / 292	European (non-Finnish)	**37.8%** 25,693 / 67,986
South Asian	**17.8%** 859 / 4,824	Remaining ancestry group	**38.9%** 824 / 2,116

Reference: gnomAD v4.1 genomes, GRCh38 16-31096368-C-T. Frequencies are allele count divided by allele number within each ancestry group. Study groups are not representative of the worldwide population. Data retrieved 2026-10-17.

About this report

27 of 30 genes have results; 117 medications have a determined guidance label.

No clear result: CYP2B6 (*18+Unknown/*9: *18 has an unrecognized variant); CYP3A4 (*1/*15: *15 has uncertain function); CYP4F2 (*1/*2: *2 has unknown function). A result that could not be determined is not a normal result.

CYP2D6 structure (copy number and gene fusions) was measured from sequencing reads.

How the results were read

Gene positions are read from the whole-genome file. The two gene copies are named and matched to published phenotype tables and medication guidance.

Sources

CPIC - Clinical Pharmacogenetics Implementation Consortium: 64 medications. Peer-reviewed prescribing guidelines.

DPWG - Dutch Pharmacogenetics Working Group: 9 medications. Prescribing guidelines used across Europe.

FDA - U.S. Food and Drug Administration: 61 medications. Pharmacogenetic information in drug labels.

Gene2Rx - Gene2Rx research summaries: 11 medications. Published studies we summarize where no guideline exists yet.

Source links in the medication guidance remain clickable in the PDF. Gene2Rx is not affiliated with or endorsed by CPIC, the FDA or DPWG. Research summaries can have different evidence and actionability from clinical guidelines.

Questions

What do I do now?

If you may have an unusual response to a medication you take or are considering, talk with your healthcare provider or a genetic counselor before making changes. The sources beside each finding explain its evidence and limits. Not every finding supports a treatment change.

Should I change medications or my dose based on this report?

No. Do not change a dose or stop a medication without talking to your healthcare provider first. Consumer DNA data is not clinical grade. Use this report to start a conversation with your provider, who may order a clinical lab test. Research on consumer genetic testing.

Are these expert annotations?

Each finding names its source. CPIC, FDA, DPWG and Gene2Rx interpretations have different levels of evidence. These organizations do not endorse Gene2Rx interpretations, which explain the research and its limitations alongside each finding.

Why would my results change?

Your genes do not change, but research does. Guidelines and drug labels are updated when new research meets strict standards and experts agree. Your report preserves the guidance used when it was made; an updated report may use newer guidance.

I do not see my medication. Why not?

Not every medication is affected by genetics, and some need more research before guidance exists. A medication may also be missing because of your report tier, your data or what this report covers. A missing medication may still have guidance from a clinical guideline or drug label.

Why should I confirm results before changing treatment? Consumer data is not clinical grade and the findings are predictions. Additional genetic variation, health conditions and other medicines can affect response. Discuss any treatment decision with your healthcare provider or pharmacist.

More questions: contact@gene2rx.com. Full interactive report: gene2rx.com.