



TBMH-PGx

Precision Mental Health
through Pharmacogenomics

PGx Medication Quick Reference List

Pharmacogenomic panel covering psychiatry, neurology, pain management, and general medicine — with CPIC, DPWG, and FDA annotation support.

74+ Medications

40+ Genes

41 Gene Types

Refer today - your patient deserves precision

A current GP referral is valid for 12 months. Address PGx referrals to “Dr Nathan Wellington” or “Dr Psychiatrist”.

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Med objects

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PGx Medication by Generic Name

The 74+ medications covered by the TBMH-PGx panel are grouped below into four broad clinical areas; Psychiatry, Neurology, Pain Management, and General Medicine, reflecting the most common prescribing contexts. Within each area, medications are listed alphabetically with their drug class and associated pharmacogene(s).

MEDICATION	DRUG CLASS	GENES
1. Psychiatry <i>Mood disorders, anxiety, psychosis, ADHD, and addiction medicine.</i>		
Alprazolam	Benzodiazepine anxiolytic	CYP3A4, CYP3A5
Amitriptyline	Tricyclic antidepressant (TCA)	CYP2C19, CYP2D6
Aripiprazole	Atypical antipsychotic	CYP2D6, CYP3A4
Atomoxetine	Selective noradrenaline reuptake inhibitor (SNRI-like)	CYP2D6
Bupropion	NDRI antidepressant / smoking cessation aid	CYP2B6, CYP2D6
Buspirone	Anxiolytic (azapirone)	CYP3A4
Carbamazepine	Anticonvulsant / mood stabiliser	CYP3A4, HLA-A, HLA-B
Chlorpromazine	Typical antipsychotic (phenothiazine)	CYP1A2, CYP2D6
Citalopram	Selective serotonin reuptake inhibitor (SSRI)	CYP2C19, CYP2D6, CYP3A4
Clomipramine	Tricyclic antidepressant (TCA)	CYP2C19, CYP2D6
Clonazepam	Benzodiazepine	CYP3A4
Clozapine	Atypical antipsychotic	CYP1A2, CYP2D6, CYP3A4
Desipramine	Tricyclic antidepressant (TCA)	CYP2D6
Desvenlafaxine	Serotonin–noradrenaline reuptake inhibitor (SNRI)	SLC6A4, UGT
Dexamphetamine (dextroamphetamine)	CNS stimulant	CYP2D6
Diazepam	Benzodiazepine	CYP2C19, CYP3A4
Dosulepin	Tricyclic antidepressant	CYP2D6
Duloxetine	Serotonin–noradrenaline reuptake inhibitor (SNRI)	CYP1A2, CYP2D6
Escitalopram	Selective serotonin reuptake inhibitor (SSRI)	CYP2C19, CYP2D6, CYP3A4
Fluoxetine	Selective serotonin reuptake inhibitor (SSRI)	CYP2D6
Flupentixol	Typical antipsychotic	CYP2D6
Fluvoxamine	Selective serotonin reuptake inhibitor (SSRI)	CYP1A2, CYP2C19, CYP2D6
Haloperidol	Typical antipsychotic (butyrophenone)	CYP2D6, CYP3A4
Imipramine	Tricyclic antidepressant	CYP2C19, CYP2D6
Lamotrigine	Anticonvulsant / mood stabiliser	UGT1A4
Lisdexamfetamine	CNS stimulant prodrug	CES1, CYP2D6
Lithium carbonate	Mood stabiliser	GSK3B
Lorazepam	Benzodiazepine	UGT2B7
Lurasidone	Atypical antipsychotic	CYP3A4
Methylphenidate	CNS stimulant	CES1
Mianserin	Tetracyclic antidepressant	CYP2D6
Mirtazapine	Noradrenergic and specific serotonergic antidepressant (NaSSA)	CYP1A2, CYP2D6, CYP3A4
Moclobemide	Reversible MAO-A inhibitor (RIMA)	CYP2C19, CYP2D6
Naltrexone	Opioid receptor antagonist	OPRM1
Nortriptyline	Tricyclic antidepressant (TCA)	CYP2D6
Olanzapine	Atypical antipsychotic	CYP1A2, CYP2D6, UGT1A4
Paliperidone	Atypical antipsychotic	CYP2D6, CYP3A4
Paroxetine	Selective serotonin reuptake inhibitor (SSRI)	CYP2D6



MEDICATION	DRUG CLASS	GENES
Phenelzine	Non-selective irreversible MAOI	MAOA
Quetiapine	Atypical antipsychotic	CYP3A4
Risperidone	Atypical antipsychotic	CYP2D6, CYP3A4
Sertraline	Selective serotonin reuptake inhibitor (SSRI)	CYP2B6, CYP2C19, CYP2D6
Sodium valproate	Anticonvulsant / mood stabiliser	CYP2C9, POLG, UGT1A6
Temazepam	Benzodiazepine hypnotic	UGT2B15
Tranylcypromine	Non-selective irreversible MAOI	MAOA
Venlafaxine	Serotonin–noradrenaline reuptake inhibitor (SNRI)	CYP2C19, CYP2D6, CYP3A4
Vortioxetine	Multimodal serotonergic antidepressant	
Ziprasidone	Atypical antipsychotic	CYP3A4
Zuclopentixol	Typical antipsychotic (thioxanthene)	CYP2D6
2. Neurology <i>Cognitive health, sleep–wake regulation, and seizure management.</i>		
Donepezil	Acetylcholinesterase inhibitor	CYP2D6, CYP3A4
Galantamine	Acetylcholinesterase inhibitor	CYP2D6, CYP3A4
Modafinil	Wakefulness-promoting	CYP2C19, CYP3A4
Phenobarbital	Barbiturate anticonvulsant	CYP2C19, CYP2C9
Phenytoin	Anticonvulsant	CYP2C19, CYP2C9
Primidone	Anticonvulsant	CYP2C19, CYP2C9
Tetrabenazine	VMAT2 inhibitor	CYP2D6
3. Pain Management <i>Analgesics for acute and chronic pain, including opioids, NSAIDs, and NMDA antagonists.</i>		
Celecoxib	COX-2 selective NSAID	CYP2C9
Codeine	Opioid analgesic (prodrug)	CYP2D6
Dihydrocodeine	Opioid analgesic	CYP2D6
Fentanyl	Opioid analgesic	CYP3A4
Flurbiprofen	NSAID	CYP2C9
Ibuprofen	Non-selective NSAID	CYP2C8, CYP2C9
Indomethacin	NSAID	CYP2C9
Ketamine / Esketamine	NMDA antagonist	CYP2B6, CYP2C19, CYP3A4
Mefenamic Acid	NSAID	CYP2C9
Meloxicam	NSAID	CYP2C9
Methadone	Opioid analgesic	CYP2B6, CYP3A4
Morphine	Opioid analgesic	ABCB1, UGT2B7
Oxycodone	Opioid analgesic	CYP2D6, CYP3A4
Piroxicam	Non-selective NSAID (oxicam)	CYP2C9
Tramadol	Opioid analgesic with monoamine reuptake inhibition	CYP2B6, CYP2D6, CYP3A4
4. General Medicine <i>Broader physiological treatments and adjunctive medications.</i>		
Guanfacine	Alpha-2A agonist	CYP3A4
Melatonin	Hormone	CYP1A2
Propranolol	Non-selective beta-blocker	CYP1A2, CYP2C19, CYP2D6



PGx Medication by Major Drug Class

The table below shows the same medications grouped by drug class, listing the generic name and associated pharmacogenes for each medication.

DRUG CLASS	MEDICATION	GENES
Acetylcholinesterase inhibitor	Donepezil	CYP2D6, CYP3A4
	Galantamine	CYP2D6, CYP3A4
Alpha-2A agonist	Guanfacine	CYP3A4
Anticonvulsant	Phenytoin	CYP2C19, CYP2C9, HLA-B
	Primidone	CYP2C19, CYP2C9
Anticonvulsant / mood stabiliser	Carbamazepine	CYP3A4, HLA-A, HLA-B
	Lamotrigine	UGT1A4
	Sodium valproate	CYP2C9, POLG, UGT1A6
Anxiolytic (azapirone)	Buspirone	CYP3A4
Atypical antipsychotic	Aripiprazole	CYP2D6, CYP3A4
	Clozapine	CYP1A2, CYP2D6, CYP3A4
	Lurasidone	CYP3A4
	Olanzapine	CYP1A2, CYP2D6, UGT1A4
	Paliperidone	CYP2D6, CYP3A4
	Quetiapine	CYP3A4
	Risperidone	CYP2D6, CYP3A4
	Ziprasidone	CYP3A4
Barbiturate anticonvulsant	Phenobarbital	CYP2C19, CYP2C9
Benzodiazepine	Clonazepam	CYP3A4
	Diazepam	CYP2C19, CYP3A4
	Lorazepam	UGT2B7
Benzodiazepine anxiolytic	Alprazolam	CYP3A4, CYP3A5
Benzodiazepine hypnotic	Temazepam	UGT2B15
CNS stimulant	Dexamphetamine (dextroamphetamine)	CYP2D6
	Methylphenidate	CES1
CNS stimulant prodrug	Lisdexamfetamine	CES1, CYP2D6
COX-2 selective NSAID	Celecoxib	CYP2C9
Hormone	Melatonin	CYP1A2
Mood stabiliser	Lithium carbonate	GSK3B
Multimodal serotonergic antidepressant	Vortioxetine	CYP2C19, CYP2C9, CYP2D6, CYP3A4, CYP3A5
NDRI antidepressant / smoking cessation aid	Bupropion	CYP2B6, CYP2D6
NMDA antagonist	Ketamine / Esketamine	CYP2B6, CYP2C19, CYP3A4
NSAID	Flurbiprofen	CYP2C9
	Indomethacin	CYP2C9
	Mefenamic Acid	CYP2C9
	Meloxicam	CYP2C9
	Ibuprofen	CYP2C8, CYP2C9
Non-selective NSAID	Ibuprofen	CYP2C8, CYP2C9
Non-selective NSAID (oxicam)	Piroxicam	CYP2C9
Non-selective beta-blocker	Propranolol	CYP1A2, CYP2C19, CYP2D6
Non-selective irreversible MAOI	Phenelzine	MAOA
	Tranylcypromine	MAOA



DRUG CLASS	MEDICATION	GENES
Noradrenergic and specific serotonergic antidepressant (NaSSA)	Mirtazapine	CYP1A2, CYP2D6, CYP3A4
Opioid analgesic	Dihydrocodeine	CYP2D6
	Fentanyl	CYP3A4
	Methadone	CYP2B6, CYP3A4
	Morphine	ABCB1, UGT2B7
	Oxycodone	CYP2D6, CYP3A4
Opioid analgesic (prodrug)	Codeine	CYP2D6
Opioid analgesic with monoamine reuptake inhibition	Tramadol	CYP2B6, CYP2D6, CYP3A4
Opioid receptor antagonist	Naltrexone	OPRM1
Reversible MAO-A inhibitor (RIMA)	Moclobemide	CYP2C19, CYP2D6
Selective noradrenaline reuptake inhibitor (SNRI-like)	Atomoxetine	CYP2D6
Selective serotonin reuptake inhibitor (SSRI)	Citalopram	CYP2C19, CYP2D6, CYP3A4
	Escitalopram	CYP2C19, CYP2D6, CYP3A4
	Fluoxetine	CYP2D6
	Fluvoxamine	CYP1A2, CYP2C19, CYP2D6
	Paroxetine	CYP2D6
	Sertraline	CYP2B6, CYP2C19, CYP2D6
Serotonin–noradrenaline reuptake inhibitor (SNRI)	Desvenlafaxine	SLC6A4, UGT
	Duloxetine	CYP1A2, CYP2D6
	Venlafaxine	CYP2C19, CYP2D6, CYP3A4
Tetracyclic antidepressant	Mianserin	CYP2D6
Tricyclic antidepressant	Dosulepin	CYP2D6
	Imipramine	CYP2C19, CYP2D6
Tricyclic antidepressant (TCA)	Amitriptyline	CYP2C19, CYP2D6
	Clomipramine	CYP2C19, CYP2D6
	Desipramine	CYP2D6
	Nortriptyline	CYP2D6
Typical antipsychotic	Flupentixol	CYP2D6
Typical antipsychotic (butyrophenone)	Haloperidol	CYP2D6, CYP3A4
Typical antipsychotic (phenothiazine)	Chlorpromazine	CYP1A2, CYP2D6
Typical antipsychotic (thioxanthene)	Zuclopenthixol	CYP2D6
VMAT2 inhibitor	Tetrabenazine	CYP2D6
Wakefulness-promoting	Modafinil	CYP2C19, CYP3A4



Genes Covered by the PGx Panel

The TBMH-PGx panel covers 52 pharmacogenes across three functional categories. Pharmacokinetic genes govern drug metabolism and transport; pharmacodynamic genes influence drug response at target sites; genes in other therapeutic domains are included for broader clinical relevance outside the psychiatric and pain drug set.

A. Pharmacokinetics

Phase I/II metabolising enzymes and drug transporters (15 genes)

GENE	# DRUGS	MEDICATIONS
CYP2D6	39	Amitriptyline, Aripiprazole, Atomoxetine, Bupropion, Chlorpromazine, Citalopram, Clomipramine, Clozapine, Codeine, Desipramine, Dexamphetamine (dextroamphetamine), Dihydrocodeine, Donepezil, Dosulepin, Duloxetine, Escitalopram, Fluoxetine, Flupentixol, Fluvoxamine, Galantamine, Haloperidol, Imipramine, Lisdexamfetamine, Mianserin, Mirtazapine, Moclobemide, Nortriptyline, Olanzapine, Oxycodone, Paliperidone, Paroxetine, Propranolol, Risperidone, Sertraline, Tetrabenazine, Tramadol, Venlafaxine, Vortioxetine, Zuclopenthixol
CYP3A4	27	Alprazolam, Aripiprazole, Buspirone, Carbamazepine, Citalopram, Clonazepam, Clozapine, Diazepam, Donepezil, Escitalopram, Fentanyl, Galantamine, Guanfacine, Haloperidol, Ketamine / Esketamine, Lurasidone, Methadone, Mirtazapine, Modafinil, Oxycodone, Paliperidone, Quetiapine, Risperidone, Tramadol, Venlafaxine, Vortioxetine, Ziprasidone
CYP2C19	17	Amitriptyline, Citalopram, Clomipramine, Diazepam, Escitalopram, Fluvoxamine, Imipramine, Ketamine / Esketamine, Moclobemide, Modafinil, Phenobarbital, Phenytoin, Primidone, Propranolol, Sertraline, Venlafaxine, Vortioxetine
CYP2C9	12	Celecoxib, Flurbiprofen, Ibuprofen, Indomethacin, Mefenamic Acid, Meloxicam, Phenobarbital, Phenytoin, Piroxicam, Primidone, Sodium valproate, Vortioxetine
CYP1A2	8	Chlorpromazine, Clozapine, Duloxetine, Fluvoxamine, Melatonin, Mirtazapine, Olanzapine, Propranolol
CYP2B6	5	Bupropion, Ketamine / Esketamine, Methadone, Sertraline, Tramadol
CES1	2	Lisdexamfetamine, Methylphenidate
CYP3A5	2	Alprazolam, Vortioxetine
UGT1A4	2	Lamotrigine, Olanzapine
UGT2B7	2	Lorazepam, Morphine
ABCB1	1	Morphine
CYP2C8	1	Ibuprofen
POLG	1	Sodium valproate
UGT1A6	1	Sodium valproate
UGT2B15	1	Temazepam

B. Pharmacodynamics

Drug targets, receptor genes, and treatment-response markers (28 genes)

Actionable associations (genes with medications in this drug set):

GENE	# DRUGS	MEDICATIONS / ROLE
HLA-B	2	Carbamazepine, Phenytoin - SJS/TEN and SCAR risk.
MAOA	2	Phenelzine, Tranylcypromine - MAO-A enzyme (MAOI drug target).
HLA-A	1	Carbamazepine - SCAR / DRESS / MPE risk (HLA-A*31:01).
OPRM1	1	Naltrexone - mu-opioid receptor (treatment-response marker for AUD).
SLC6A4	1	Desvenlafaxine - serotonin transporter (SSRI/SNRI target; response marker).
GSK3B	1	Lithium carbonate - glycogen synthase kinase-3 beta (lithium target; response).

Treatment response & efficacy markers (pharmacodynamic candidates; evidence is predominantly research-grade and not for standalone prescribing decisions):

GENE	FUNCTION	DRUG CLASS / CONTEXT
ADRA2A	Alpha-2A adrenoceptor	Guanfacine target; methylphenidate / stimulant response in ADHD.
ANKK1	DRD2 Taq1A proxy	Dopamine D2 receptor density; antipsychotic response / EPS risk.
APOE	Apolipoprotein E	epsilon 4 status; cholinesterase-inhibitor (donepezil / galantamine) response in dementia.
BDNF	Brain-derived neurotrophic factor	Val66Met; antidepressant and lithium response; neuroplasticity.
COMT	Catechol-O-methyltransferase	Val158Met; prefrontal dopamine; antipsychotic / stimulant response.
DBH	Dopamine beta-hydroxylase	Noradrenaline synthesis; noradrenergic drug response.
DRD1	Dopamine D1 receptor	Antipsychotic and stimulant treatment response.
DRD4	Dopamine D4 receptor	ADHD stimulant (methylphenidate) response; VNTR variants.



GENE	FUNCTION	DRUG CLASS / CONTEXT
FKBP5	FK506-binding protein 5	HPA-axis regulation; antidepressant response and recurrence.
FLOT1	Flotillin-1	Lithium response and tolerability candidate.
GABRA6	GABA-A alpha 6 subunit	GABAergic sensitivity; benzodiazepine and anaesthetic response.
GABRP	GABA-A pi subunit	GABAergic drug response marker.
GRIA1	AMPA receptor subunit 1	Glutamatergic; antidepressant response candidate.
GRIK4	Kainate receptor subunit 4	Antidepressant (citalopram) response - STAR*D data.
GRIN2B	NMDA receptor subunit 2B	Glutamatergic; ketamine / esketamine and antidepressant response.
HTR1A	5-HT1A receptor	Antidepressant and buspirone (anxiolytic) response.
HTR2A	5-HT2A receptor	Antidepressant response; GI / sexual adverse effects.
HTR2C	5-HT2C receptor	Antipsychotic-induced weight gain and metabolic syndrome risk.
ITGB3	Integrin beta 3 (platelet)	Platelet serotonin transport; SSRI response marker.
MTHFR	Methylenetetrahydrofolate reductase	Folate cycle; L-methylfolate augmentation rationale for antidepressants.
OPRD1	Delta-opioid receptor	Opioid analgesia and addiction phenotype candidate.
OPRK1	Kappa-opioid receptor	Opioid response and naltrexone-related phenotypes.

C. Other Therapeutic Domains Panel genes not represented in this drug set (9 genes)

These genes are included for specific medication prescribing not included within psychiatric prescribing contexts (cardiology, oncology, thrombophilia, HIV).

GENE	THERAPEUTIC DOMAIN	CLINICAL APPLICATION (OUTSIDE THIS DRUG SET)
ABCG2	Transporter, BCRP efflux	Rosuvastatin / statin exposure; allopurinol hypersensitivity risk. (Cardiovascular / rheumatology)
DPYD	Pyrimidine catabolism	Fluoropyrimidines (5-FU, capecitabine) - severe toxicity risk. (Oncology; CPIC High)
F2	Prothrombin G20210A	Venous thromboembolism / clotting risk - relevant for OCP, HRT. (Thrombophilia)
F5	Factor V Leiden	Venous thromboembolism / clotting risk. (Thrombophilia)
HCP5	HLA-B*57:01 tag SNP	Abacavir hypersensitivity (HIV pharmacotherapy). (Infectious disease)
KIF6	Kinesin family member 6	Statin cardiovascular benefit marker (evidence contested). (Cardiovascular)
SLCO1B1	Hepatic uptake transporter (OATP1B1)	Simvastatin / statin myopathy risk. (Cardiovascular; CPIC High)
TPMT	Thiopurine S-methyltransferase	Azathioprine / mercaptopurine / thioguanine toxicity. (Oncology / rheumatology; CPIC High)
VKORC1	Vitamin K epoxide reductase	Warfarin dose sensitivity (with CYP2C9). (Anticoagulation; CPIC High)



Star Allele & Diplotype Notation

Each gene result is reported as a diplotype — the combination of two alleles (one from each parent), written in star (*) notation. The diplotype determines the predicted phenotype.

NOTATION	MEANING	EXPLANATION
*1/*1	Two reference alleles	The *1 allele is typically the reference (wild-type). A *1/*1 diplotype usually predicts normal enzyme function (Normal Metaboliser).
*1/*2	One reference + one variant	Heterozygous — carries one normal and one variant allele. Functional impact depends on the specific variant's assigned activity.
*3/*3	Homozygous variant	Both copies carry the same non-reference allele. Often associated with significantly altered (e.g. poor) enzyme function.
*5/*6	Compound heterozygous	Two different variant alleles. The combined effect depends on each allele's individual function level summed via the activity-score system.
*58:01 positive	HLA allele present	For HLA genes (e.g. HLA-A, HLA-B), results are reported as positive/negative. Positive means the patient carries at least one copy of the risk allele — e.g. HLA-B*15:02 with carbamazepine.
Reference / Reference	No variant detected	Some genes use "Reference" instead of star notation to indicate wild-type sequence at the assayed positions.

Activity Scores

CYP2D6 and CYP2C9 use a numerical activity score (AS) system. Each allele is assigned a function value; the two values are summed to produce the diplotype activity score, which then maps to a phenotype band.

VALUE	PHENOTYPE BAND	MEANING
0	Poor metaboliser (PM)	No functional enzyme activity. Significant dose reduction or an alternative drug is usually required.
0.25 – 1.0	Intermediate metaboliser (IM)	Reduced function. May require dose reduction or TDM. E.g. CYP2D6 *1/*4 with AS = 1.0.
1.25 – 2.25	Normal metaboliser (NM)	Standard expected enzyme activity. Normal label dosing is appropriate.
> 2.25	Ultra-rapid metaboliser (UM)	Higher-than-normal activity. Subtherapeutic levels likely at standard doses; prodrugs may be over-activated.
n/a	No score defined	No activity score is defined for this gene by the relevant guideline (applies to genes outside CYP2D6 / CYP2C9).
No scores captured	Not annotated	The annotation did not include activity-score data for this gene–drug pair.

Guideline Sources

Each drug gene interaction recommendation is referenced by one or more of the following guideline sources below.

SOURCE	DESCRIPTION
CPIC	Clinical Pharmacogenetics Implementation Consortium (USA). The international gold-standard, evidence-graded peer-reviewed guidelines (Strong / Moderate / Optional) used widely for gene–drug prescribing.
DPWG	Dutch Pharmacogenetics Working Group. European-origin therapeutic dose recommendations — often more prescriptive than CPIC (e.g. "avoid" versus "consider alternative").
FDA PGx	U.S. Food and Drug Administration pharmacogenomic associations and biomarker entries listed in drug labelling. May not always include specific dosing guidance.