

Patient: Patient, Test
DOB: 11/19/1977
Sex: Male
Ordering Physician: Dr. Gerald Hallowell

Sample #: 33210024
Collection Date: 01/29/2021
Received Date: 02/02/2021
Reported On: 02/04/2021

Medication Alternatives Summary

Psychiatry			
Therapeutic Class	✔ Standard Precautions	! Use With Caution	✘ Consider Alternatives
Anti-ADHD	Guanfacine (Intuniv)	Atomoxetine (Strattera) Methylphenidate (Ritalin) Dexmethylphenidate (Focalin)	Amphetamine (Component of Adderall) Dextroamphetamine (Component of Adderall) Lisdexamfetamine (Vyvanse)
SSRIs / SNRIs	Duloxetine (Cymbalta) Desvenlafaxine (Pristiq)	Paroxetine (Paxil) Fluvoxamine (Luvox) Venlafaxine (Effexor)	Citalopram (Celexa) Escitalopram (Lexapro) Fluoxetine (Prozac) Sertraline (Zoloft)
Tricyclics (TCAs)	Protriptyline (Vivactil)	Nortriptyline (Pamelor) Trimipramine (Surmontil) Desipramine (Norpramin)	Amitriptyline (Elavil) Doxepin (Sinequan) Imipramine (Tofranil) Clomipramine (Anafranil)
Other Antidepressants		Bupropion (Wellbutrin) Trazodone (Desyrel)	Mirtazapine (Remeron) Vilazodone (Viibryd)
Antipsychotics	Quetiapine (Seroquel) Ziprasidone (Geodon)	Clozapine (Clozaril) Olanzapine (Zyprexa)	Thioridazine (Mellaril) Risperidone (Risperdal) Aripiprazole (Abilify) Haloperidol (Haldol) Lurasidone (Latuda)
Anxiolytics	Hydroxyzine (Vistaril)	Diazepam (Valium) Buspirone (Buspar)	Alprazolam (Xanax) Clonazepam (Klonopin) Lorazepam (Ativan) Oxazepam (Serax)
Other Agents	Lithium Carbonate (Lithobid)	Benzotropine (Cogentin)	Trihexyphenidyl (Artane) Modafinil (Provigil) Armodafinil (Nuvigil)
Anti-Addiction Agents	Disulfiram (Antabuse)	Varenicline (Chantix)	Naloxone (Narcan) Naltrexone (Revia)

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Medication Alternatives Summary

Neurology			
Therapeutic Class	✔ Standard Precautions	! Use With Caution	✘ Consider Alternatives
Anticonvulsants	Gabapentin (Neurontin) Pregabalin (Lyrica)	Phenytoin (Dilantin) Phenobarbital Fosphenytoin (Cerebyx) Valproic Acid (Depakote)	Divalproex (Depakote) Carbamazepine (Tegretol) Oxcarbazepine (Trileptal) Levetiracetam (Keppra) Topiramate (Topamax) Lamotrigine (Lamictal)
Sedatives	Zaleplon (Sonata)	Trazodone (Desyrel) Triazolam (Halcion) Temazepam (Restoril)	Zolpidem (Ambien) Suvorexant (Belsomra) Eszopiclone (Lunesta) Ramelteon (Rozerem)
Anesthetics	Methoxyflurane(Penthrox)	Fentanyl (Duragesic) Meperidine (Demerol) Ketamine (Ketalar) Sevoflurane (Ultane)	Midazolam (Versed) Propofol (Diprivan) Desflurane (Suprane) Enflurane (Ethrane) Halothane (Fluothane) Isoflurane (Forane)
Other Agents	Memantine (Namenda)	Donepezil (Aricept) Pramipexole (Mirapex)	Ropinirole (Requip) Selegiline (Zelapar) Carbidopa/Levodopa
Anti-Migraine Agents	Sumatriptan (Imitrex)	Rizatriptan (Maxalt)	Zolmitriptan (Zomig) Eletriptan (Relpax)

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Dosing Guidance Summary

Drug	Phenotype	Recommendation	Evidence
Neurology - Anticonvulsants			
Phenytoin (Dilantin)	⚠️ CYP2C19 Ultra Rapid Metabolizer	Phenytoin (Dilantin) serum levels may decrease in CYP2C19 ultra rapid metabolizers. Drug may have decreased efficacy. Adjust dose based upon phenytoin serum levels or consider prescribing carbamazepine (Tegretol), lamotrigine (Lamictal), or levetiracetam (Keppra) instead.	<i>Informative</i>
Phenobarbital	⚠️ CYP2C19 Ultra Rapid Metabolizer	Phenobarbital serum levels may decrease in CYP2C19 ultra rapid metabolizers. Drug may have decreased efficacy. If clinically necessary, increase the dose or consider prescribing an alternative instead.	<i>Informative</i>
Neurology - Other Agents			
Selegiline (Zelapar)	✅ CYP2B6 Intermediate Metabolizer	Selegiline (Zelapar) may be prescribed and monitored according to standard procedures in CYP2B6 intermediate metabolizers.	<i>Informative</i>
Donepezil (Aricept)	⚠️ CYP2D6 Intermediate Metabolizer	Donepezil (Aricept) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects such as headache, insomnia, nausea, or diarrhea. If clinically necessary, decrease the dose or consider prescribing an alternative instead.	<i>Informative</i>

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Dosing Guidance Summary

Drug	Phenotype	Recommendation	Evidence
Psychiatry - Anti-ADHD			
Dextroamphetamine (Component of Adderall)	⚠ CYP2D6 Intermediate Metabolizer	Dextroamphetamine (Component of Adderall) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects such as decreased appetite, weight loss, xerostomia, or insomnia. If clinically necessary, decrease the dose or consider prescribing methylphenidate (Ritalin), dexmethylphenidate (Focalin), or guanfacine (Intuniv) instead.	<i>Informative</i>
Lisdexamfetamine (Vyvanse)	⚠ CYP2D6 Intermediate Metabolizer	Lisdexamfetamine (Vyvanse) active metabolite dextroamphetamine serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects such as decreased appetite, weight loss, xerostomia, or insomnia. If clinically necessary, decrease the dose or consider prescribing methylphenidate (Ritalin), dexmethylphenidate (Focalin), or guanfacine (Intuniv) instead.	<i>Informative</i>
Psychiatry - Anti-Addiction Agents			
Naltrexone (Revia)	✅ OPRM1 Homozygote Wild Type	Average (normal) clinical response to naltrexone in alcoholic patients.	<i>Informative</i>

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Dosing Guidance Summary

Drug	Phenotype	Recommendation	Evidence
Psychiatry - Antipsychotics			
Clozapine (Clozaril)	 CYP2C19 Ultra Rapid Metabolizer	Clozapine (Clozaril) may be prescribed and monitored according to standard procedures in CYP2C19 ultra rapid metabolizers.	<i>Informative</i>
Risperidone (Risperdal)	 CYP2D6 Intermediate Metabolizer	Risperidone (Risperdal) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects. If clinically necessary, decrease the dose or consider prescribing ziprasidone (Geodon), olanzapine (Zyprexa), or lurasidone (Latuda) instead.	<i>Actionable</i>
Aripiprazole (Abilify)	 CYP2D6 Intermediate Metabolizer	Aripiprazole (Abilify) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects. If clinically necessary, decrease the dose or consider prescribing ziprasidone (Geodon), olanzapine (Zyprexa), or lurasidone (Latuda) instead.	<i>Informative</i>
Thioridazine (Mellaril)	 CYP2D6 Intermediate Metabolizer	Thioridazine (Mellaril) is contraindicated in CYP2D6 intermediate metabolizers due to an increased risk of QTc prolongation, Torsades de pointes, and sudden death.	<i>Actionable</i>
Haloperidol (Haldol)	 CYP2D6 Intermediate Metabolizer	Haloperidol (Haldol) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects. If clinically necessary, decrease the dose or consider prescribing an alternative instead.	<i>Informative</i>
Quetiapine (Seroquel)	 CYP2D6 Intermediate Metabolizer	Quetiapine (Seroquel) may be prescribed and monitored according to standard procedures in CYP2D6 intermediate metabolizers.	<i>Informative</i>

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Dosing Guidance Summary

Drug	Phenotype	Recommendation	Evidence
Psychiatry - Antipsychotics			
Clozapine (Clozaril)	⚠️ HTR2C-rs1414334 Homozygote Mutant	The C allele (rs1414334) is associated with an increased risk of clozapine-induced obesity and metabolic syndrome in schizophrenic and schizoaffective patients.	<i>Informative</i>
Risperidone (Risperdal)	⚠️ HTR2C-rs1414334 Homozygote Mutant	The C allele (rs1414334) is associated with an increased risk of risperidone-induced obesity and metabolic syndrome in schizophrenic and schizoaffective patients.	<i>Informative</i>
Olanzapine (Zyprexa)	⚠️ HTR2C-rs3813929 Homozygote Wild Type	Schizophrenic patients are at normal risk for olanzapine-induced weight gain.	<i>Informative</i>
Psychiatry - Anxiolytics			
Diazepam (Valium)	⚠️ CYP2C19 Ultra Rapid Metabolizer	Diazepam (Valium) serum levels may decrease in CYP2C19 ultra rapid metabolizers. Drug may have decreased efficacy. If clinically necessary, increase the dose or consider prescribing lorazepam (Ativan), clonazepam (Klonopin), or alprazolam (Xanax) instead.	<i>Informative</i>
Buspirone (Buspar)	⚠️ CYP2D6 Intermediate Metabolizer	Buspirone (Buspar) active metabolite 1-PP serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects. If clinically necessary, decrease the dose or consider prescribing an alternative instead.	<i>Informative</i>

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Psychiatry - Anxiolytics			
Diazepam (Valium)	 CYP3A5 Ultra Rapid Metabolizer	Diazepam (Valium) active metabolite desmethyldiazepam serum levels may decrease in CYP3A5 ultra rapid metabolizers. Drug may have decreased efficacy. If clinically necessary, increase the dose or consider prescribing lorazepam (Ativan), clonazepam (Klonopin), or alprazolam (Xanax) instead.	<i>Informative</i>
Psychiatry - Other Agents			
Benzotropine (Cogentin)	 CYP2D6 Intermediate Metabolizer	Benzotropine (Cogentin) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. If clinically necessary, decrease the dose or consider prescribing trihexyphenidyl (Artane) instead.	<i>Informative</i>
Armodafinil (Nuvigil)	 CYP3A5 Ultra Rapid Metabolizer	Armodafinil (Nuvigil) may be prescribed and monitored according to standard procedures in CYP3A5 ultra rapid metabolizers.	<i>Informative</i>
Psychiatry - Other Antidepressants			
Bupropion (Wellbutrin)	 ANKK1 Increased Risk	Bupropion may be ineffective in smoking cessation.	<i>Informative</i>

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Psychiatry - Other Antidepressants			
Bupropion (Wellbutrin)	 CYP2B6 Intermediate Metabolizer	Bupropion (Wellbutrin) active metabolite hydroxybupropion serum levels may decrease in CYP2B6 intermediate metabolizers. Drug may have decreased efficacy. If clinically necessary, increase the dose or consider prescribing escitalopram (Lexapro), duloxetine (Cymbalta), or varenicline (Chantix) instead.	<i>Informative</i>
Mirtazapine (Remeron)	 CYP2D6 Intermediate Metabolizer	Mirtazapine (Remeron) serum levels may increase in CYP2D6 intermediate metabolizers. Standard dosing regimens may be considered due to conflicting evidence demonstrating negative outcomes.	<i>Informative</i>
Bupropion (Wellbutrin)	 CYP2D6 Intermediate Metabolizer	Bupropion (Wellbutrin) active metabolite hydroxybupropion serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects. If clinically necessary, decrease the dose or consider prescribing escitalopram (Lexapro), sertraline (Zoloft), or varenicline (Chantix) instead.	<i>Informative</i>

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Drug	Phenotype	Recommendation	Evidence
Psychiatry - Other Antidepressants			
Trazodone (Desyrel)	 CYP2D6 Intermediate Metabolizer	Trazodone (Desyrel) active metabolite mCPP serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects such as dizziness, anxiety, seizures, or exacerbation of psychiatric symptoms. If clinically necessary, decrease the dose or consider prescribing an alternative instead.	<i>Informative</i>
Psychiatry - SSRIs / SNRIs			
Sertraline (Zoloft)	 CYP2B6 Intermediate Metabolizer	Sertraline (Zoloft) may be prescribed and monitored according to standard procedures in CYP2B6 intermediate metabolizers.	<i>Informative</i>
Citalopram (Celexa)	 CYP2C19 Ultra Rapid Metabolizer	Citalopram (Celexa) serum levels may decrease in CYP2C19 ultra rapid metabolizers. Drug may have decreased efficacy. Consider prescribing duloxetine (Cymbalta), bupropion (Wellbutrin), or paroxetine (Paxil) instead.	<i>Actionable</i>
Escitalopram (Lexapro)	 CYP2C19 Ultra Rapid Metabolizer	Escitalopram (Lexapro) serum levels may decrease in CYP2C19 ultra rapid metabolizers. Drug may have decreased efficacy. Consider prescribing duloxetine (Cymbalta), bupropion (Wellbutrin), or paroxetine (Paxil) instead.	<i>Actionable</i>

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Drug	Phenotype	Recommendation	Evidence
Psychiatry - SSRIs / SNRIs			
Fluoxetine (Prozac)	✔ CYP2C19 Ultra Rapid Metabolizer	Fluoxetine (Prozac) serum levels may decrease and norfluoxetine serum levels may increase in CYP2C19 ultra rapid metabolizers. Standard dosing regimens may be considered due to a lack of pharmacodynamic evidence.	<i>Informative</i>
Sertraline (Zoloft)	✔ CYP2C19 Ultra Rapid Metabolizer	Sertraline (Zoloft) serum levels in CYP2C19 ultra rapid metabolizers are comparable to normal metabolizers. If patients do not respond to recommended maintenance dosing, consider prescribing duloxetine (Cymbalta), bupropion (Wellbutrin), or paroxetine (Paxil) instead.	<i>Actionable</i>
Duloxetine (Cymbalta)	✔ CYP2D6 Intermediate Metabolizer	Duloxetine (Cymbalta) may be prescribed and monitored according to standard procedures in CYP2D6 intermediate metabolizers.	<i>Informative</i>
Fluoxetine (Prozac)	✔ CYP2D6 Intermediate Metabolizer	Fluoxetine (Prozac) serum levels may increase and norfluoxetine serum levels may decrease in CYP2D6 intermediate metabolizers. Standard dosing regimens may be considered due to conflicting evidence demonstrating negative outcomes.	<i>Informative</i>

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Drug	Phenotype	Recommendation	Evidence
Psychiatry - SSRIs / SNRIs			
Paroxetine (Paxil)	⚠️ CYP2D6 Intermediate Metabolizer	Paroxetine (Paxil) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects. If clinically necessary, decrease the dose or consider prescribing escitalopram (Lexapro), sertraline (Zoloft), or desvenlafaxine (Pristiq) instead.	<i>Informative</i>
Fluvoxamine (Luvox)	⚠️ CYP2D6 Intermediate Metabolizer	Fluvoxamine (Luvox) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects. If clinically necessary, decrease the dose or consider prescribing escitalopram (Lexapro), sertraline (Zoloft), or desvenlafaxine (Pristiq) instead.	<i>Informative</i>
Venlafaxine (Effexor)	⚠️ CYP2D6 Intermediate Metabolizer	Venlafaxine (Effexor) serum levels may increase and active metabolite desvenlafaxine serum levels may decrease in CYP2D6 intermediate metabolizers. Patients may be at increased risk for adverse effects and drug may have decreased efficacy. If clinically necessary, consider prescribing escitalopram (Lexapro), sertraline (Zoloft), or desvenlafaxine (Pristiq) instead.	<i>Actionable</i>
Citalopram (Celexa)	⚠️ GRIK4 Homozygote Wild Type	Citalopram may have decreased efficacy in depressed patients compared to GRIK4 homozygous mutant patients.	<i>Informative</i>

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Drug	Phenotype	Recommendation	Evidence
Psychiatry - SSRIs / SNRIs			
Citalopram (Celexa)	 HTR2A Homozygote Wild Type	Citalopram may have decreased efficacy in depressed patients compared to HTR2A (rs7997012) heterozygous and homozygous mutant patients.	<i>Informative</i>
Psychiatry - Tricyclics (TCAs)			
Amitriptyline (Elavil)	 CYP2C19 Ultra Rapid Metabolizer	Amitriptyline (Elavil) serum levels may decrease in CYP2C19 ultra rapid metabolizers. Drug may have decreased efficacy. Consider prescribing an alternative tricyclic antidepressant such as nortriptyline (Pamelor), desipramine (Norpramin), or protriptyline (Vivactil) instead. If amitriptyline is warranted, consider utilizing therapeutic drug monitoring to guide dosage adjustment.	<i>Actionable</i>
Doxepin (Sinequan)	 CYP2C19 Ultra Rapid Metabolizer	Doxepin (Sinequan) serum levels may decrease and active metabolite nordoxepin serum levels may increase in CYP2C19 ultra rapid metabolizers. Consider prescribing an alternative tricyclic antidepressant such as nortriptyline (Pamelor), desipramine (Norpramin), or protriptyline (Vivactil) instead. If doxepin is warranted, consider utilizing therapeutic drug monitoring to guide dosage adjustment.	<i>Actionable</i>

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Dosing Guidance Summary

Drug	Phenotype	Recommendation	Evidence
Psychiatry - Tricyclics (TCAs)			
Imipramine (Tofranil)	 CYP2C19 Ultra Rapid Metabolizer	Imipramine (Tofranil) serum levels may decrease in CYP2C19 ultra rapid metabolizers. Drug may have decreased efficacy. Consider prescribing an alternative tricyclic antidepressant such as nortriptyline (Pamelor), desipramine (Norpramin), or protriptyline (Vivactil) instead. If imipramine is warranted, consider utilizing therapeutic drug monitoring to guide dosage adjustment.	<i>Actionable</i>
Clomipramine (Anafranil)	 CYP2C19 Ultra Rapid Metabolizer	Clomipramine (Anafranil) serum levels may decrease in CYP2C19 ultra rapid metabolizers. Consider prescribing an alternative tricyclic antidepressant such as nortriptyline (Pamelor), desipramine (Norpramin), or protriptyline (Vivactil) instead. If clomipramine is warranted, consider utilizing therapeutic drug monitoring to guide dosage adjustment.	<i>Actionable</i>

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Psychiatry - Tricyclics (TCAs)			
Amitriptyline (Elavil)	 CYP2D6 Intermediate Metabolizer	Amitriptyline (Elavil) and metabolite nortriptyline serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. Consider prescribing a non-tricyclic antidepressant instead. If amitriptyline is warranted, consider a 25% reduction in the recommended starting dose and utilize therapeutic drug monitoring to further guide dosage adjustment.	<i>Actionable</i>
Nortriptyline (Pamelor)	 CYP2D6 Intermediate Metabolizer	Nortriptyline (Pamelor) serum levels may increase and metabolite 10-hydroxynortriptyline serum levels may decrease in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. Consider prescribing a non-tricyclic antidepressant instead. If nortriptyline is warranted, consider a 25% reduction in the recommended starting dose and utilize therapeutic drug monitoring to further guide dosage adjustment.	<i>Actionable</i>

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Drug	Phenotype	Recommendation	Evidence
Psychiatry - Tricyclics (TCAs)			
Doxepin (Sinequan)	 CYP2D6 Intermediate Metabolizer	Doxepin (Sinequan) and metabolite nordoxepin serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. Consider prescribing a non-tricyclic antidepressant instead. If doxepin is warranted, consider a 25% reduction in the recommended starting dose and utilize therapeutic drug monitoring to further guide dosage adjustment.	<i>Actionable</i>
Trimipramine (Surmontil)	 CYP2D6 Intermediate Metabolizer	Trimipramine (Surmontil) and metabolite desmethyltrimipramine serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. Consider prescribing a non-tricyclic antidepressant instead. If trimipramine is warranted, consider a 25% reduction in the recommended starting dose and utilize therapeutic drug monitoring to further guide dosage adjustment.	<i>Actionable</i>

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Drug	Phenotype	Recommendation	Evidence
Psychiatry - Tricyclics (TCAs)			
Imipramine (Tofranil)	 CYP2D6 Intermediate Metabolizer	Imipramine (Tofranil) and metabolite desipramine serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. Consider prescribing a non-tricyclic antidepressant instead. If imipramine is warranted, consider a 25% reduction in the recommended starting dose and utilize therapeutic drug monitoring to further guide dosage adjustment.	<i>Actionable</i>
Desipramine (Norpramin)	 CYP2D6 Intermediate Metabolizer	Desipramine (Norpramin) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. Consider prescribing a non-tricyclic antidepressant instead. If desipramine is warranted, consider a 25% reduction in the recommended starting dose and utilize therapeutic drug monitoring to further guide dosage adjustment.	<i>Actionable</i>

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Psychiatry - Tricyclics (TCAs)			
Clomipramine (Anafranil)	 CYP2D6 Intermediate Metabolizer	Clomipramine (Anafranil) and metabolite desmethylclomipramine serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. Consider prescribing a non-tricyclic antidepressant instead. If clomipramine is warranted, consider a 25% reduction in the recommended starting dose and utilize therapeutic drug monitoring to further guide dosage adjustment.	<i>Actionable</i>
Protriptyline (Vivactil)	 CYP2D6 Intermediate Metabolizer	Protriptyline (Vivactil) serum levels may increase in CYP2D6 intermediate metabolizers. Patients may be at increased risk for anticholinergic adverse effects. Consider prescribing a non-tricyclic antidepressant instead. If protriptyline is warranted, consider a 25% reduction in the recommended starting dose and utilize therapeutic drug monitoring to further guide dosage adjustment.	<i>Actionable</i>

Patient Information Card

This card contains an abbreviated genetic summary.

It is not intended as a replacement for the Comprehensive Pharmacogenetic Clinical Report.

 Personalized Genetic Markers		
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DOB: 11/19/1977	Sample #: 33210024	
Pharmacogenetic Test Results		
ABCB1-rs1045642	G/G	Homozygote Mutant
ABCB1-rs2032582	C/C	Homozygote Mutant
ACE	A/A	Homozygote Mutant
ANKK1	A/A	Increased Risk
APOE	C/C	Homozygote Wild Type
ATM	C/C	Homozygote Wild Type
BCHE-rs1799807	T/T	Homozygote Wild Type
BCHE-rs1803274	C/C	Homozygote Wild Type
CES1	C/C	Homozygote Wild Type
COMT-rs13306278	C/C	Homozygote Wild Type
COMT-rs4680	G/G	Homozygote Wild Type
CYP2B6	*1/*6	Intermediate Metabolizer
CYP2C19	*17/*17	Ultra Rapid Metabolizer
CYP2C8	T/T	Homozygote Wild Type
CYP2C9	*1/*1	Normal Metabolizer
CYP2D6	*5/*10	Intermediate Metabolizer
CYP3A4-rs2242480	T/T	Homozygote Mutant
CYP3A4-rs2740574	C/C	Homozygote Mutant
CYP3A5	*1/*1	Ultra Rapid Metabolizer
CYP4F2	C/C	Homozygote Wild Type
DPYD	*1/*1	High Activity
DRD2	T/T	Homozygote Wild Type
ERCC1-rs11615	G/G	Homozygote Mutant
ERCC1-rs3212986	A/C	Heterozygote
F2	G/G	Homozygote Wild Type
F5	C/C	Homozygote Wild Type
G6PD-rs1050828	C/C	Homozygote Wild Type
G6PD-rs1050829	C/T	Heterozygote
G6PD-rs5030868	G/G	Homozygote Wild Type
GGCX	C/C	Homozygote Wild Type
GRIK4	T/T	Homozygote Wild Type
GSTP1	A/A	Homozygote Wild Type
HLA-B-rs144012689	T/T	Homozygote Wild Type