



## San Francisco Health Network Behavioral Health Services Medication Use Improvement Committee

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### SAFER PRESCRIBING OF ANTIDEPRESSANT MEDICATION GUIDELINE

**SCOPE:** This Safer Prescribing of Antidepressant Medications Guideline is intended to offer antidepressant prescribing guidance for providers, clients and the interested general public to increase the effectiveness and safety of antidepressant use. It is not intended to be comprehensive in scope. These recommendations are not a substitute for clinical judgment, and decisions about care must carefully consider and incorporate the clinical characteristics and circumstances of each individual.

**INTRODUCTION:** Antidepressant medications are prescribed for multiple conditions in mental health. They have a critical role in the treatment of major depressive disorder and other depressive disorders. Although known as antidepressants, many of these medications are used to treat other mental disorders besides depression, including anxiety disorders, obsessive compulsive disorder, post-traumatic stress disorder and others. Although this class of medications is sometimes used in bipolar disorder, this treatment recommendation is complex and beyond the scope of this guideline. See introduction and treatment guidelines in the references and further reading section at the end of this document for suggested treatment algorithms for the use of these medications.

Antidepressant medications are often divided into families based upon mechanism of action or chemical structure: selective serotonin reuptake inhibitors (SSRIs) have their primary effect on modulating the neurotransmitter serotonin; serotonin norepinephrine reuptake inhibitors (SNRIs) modulate serotonin and norepinephrine; tricyclic antidepressants (TCAs) often have a chemical structure with three rings; monoamine oxidase inhibitors (MAOIs) inhibit the monoamine oxidase enzyme. There are other antidepressant medications both within these families as well as in other families with other mechanisms of action and chemical structures.

For the most part, antidepressant medications are only available in oral forms. There is one antidepressant, selegiline, that is available in a transdermal patch.

The selection of a specific antidepressant medication, form of administration, dose and duration of treatment is a complex decision-making process involving multiple factors. These factors often include individualized treatment goal(s), client choice, history of past antidepressant medication trials, family history, side effect profile and other factors.

## **SELECTIVE SEROTONIN REUPTAKE INHIBITORS (SSRIs):**

Selective serotonin reuptake inhibitors, or SSRIs, work by inhibiting synaptic reuptake of serotonin in neurons, increasing serotonin availability and leading to downstream modulation of serotonin receptors. SSRIs are first line for the treatment of major depressive disorder, anxiety disorders, trauma-related disorders and obsessive compulsive disorder.

When prescribing SSRIs, one should begin at the low end of the dosage range and gradually titrate up to the FDA maximum dose, if clinically warranted. Due to genetic variability, some individuals are very sensitive to SSRI adverse effects and may require even lower starting doses. See Table 1 for more information about SSRIs.

SSRIs can take anywhere between 4-12 weeks for their full effect. Sudden cessation of SSRIs can lead to discontinuation syndrome, consisting of flu-like symptoms, sleep disturbances, imbalance, tremors, dizziness, electric-shock sensations, agitation and confusion. When stopping SSRI treatment, prescribers should gradually taper the dose to minimize the risk of discontinuation syndrome.

Common initial side effects from SSRIs include headaches, nausea and gastrointestinal effects (constipation, diarrhea, vomiting). These effects are usually mild and tend to dissipate in 1-2 weeks. Some individuals experience an initial increase in anxiety. This too tends to improve over time. SSRIs occasionally cause bruxism (teeth grinding) and an increase in sweating. Sexual dysfunction may occur with SSRI treatment. The most common types of dysfunction are delayed ejaculation and anorgasmia. Sexual side effects do not tend to improve over time. SSRIs block serotonin transporter sites on platelets and osteocytes and are associated with increased risk of bleeding, bone resorption and hyponatremia.

**TABLE 1: SELECTIVE SEROTONIN REUPTAKE INHIBITORS**

Generic Name	Dosage Range	Comments
Citalopram*	10-40 mg/day	Well tolerated; QTc prolongation and FDA warning for abnormal heart rhythms; Fewer drug interactions
Escitalopram	5-20 mg/day	Well tolerated; QTc prolongation; Fewer drug interactions
Fluoxetine	10-80 mg/day	Most activating (insomnia, diarrhea, initial increase in anxiety); More drug interactions; Least likely to cause discontinuation syndrome; QTc prolongation
Fluvoxamine	50-300 mg/day	Most sedating
Paroxetine	10-60 mg/day	Sedating, anticholinergic effects; Drug interactions
Sertraline	50-200 mg/day	Slightly activating; Fewer drug interactions
Vilazodone	10-40 mg/day	Nausea, anorexia, diarrhea

\*See Appendix 1: Special considerations when using the SSRI citalopram

**SEROTONIN AND NOREPINEPHRINE REUPTAKE INHIBITORS (SNRIs):**

Serotonin and norepinephrine reuptake inhibitors, or SNRIs, work by blocking presynaptic serotonin and norepinephrine transporter proteins, thus inhibiting reuptake of these neurotransmitters and increasing stimulation of postsynaptic receptors. The effect of SNRIs on serotonin and norepinephrine reuptake is dose dependent. For example, venlafaxine acts like an SSRI at low doses, but at 150 mg daily and above, it has a significant effect on norepinephrine reuptake. Duloxetine affects serotonin and norepinephrine reuptake at all doses. Similar to SSRIs, SNRIs should be started at lower doses and titrated gradually. SNRIs should not be stopped abruptly due to discontinuation syndrome. See Table 2 for more information about SNRIs.

Common side effects from SNRIs are diaphoresis, dizziness, headache and nausea. Nausea tends to diminish over time and the medication may be better tolerated with food. Sexual dysfunction is common. Stimulation of norepinephrine receptors in the sympathetic nervous system leads to decrease in parasympathetic tone, leading to constipation, dry mouth and urinary retention. Due to their serotonergic effect, SNRIs block serotonin transporter sites on platelets and osteocytes and have been associated with increased risk of bleeding, bone resorption and hyponatremia.

All SNRIs are associated with elevated blood pressure due to norepinephrine effects. Blood pressure should be evaluated prior to initiating SNRIs, and their use should be avoided in individuals with uncontrolled hypertension. Blood pressure should be monitored on a regular basis in individuals taking SNRIs. If necessary, antihypertensive treatment should be initiated or an alternative antidepressant agent should be used. (See *BHS Adult Blood Pressure Monitoring Guidelines* for more information).

**TABLE 2: SEROTONIN AND NOREPINEPHRINE REUPTAKE INHIBITORS**

Generic Name	Dosage Range	Comments
Desvenlafaxine	50-100 mg/day	Monitor blood pressure
Duloxetine	60-120 mg/day	Monitor blood pressure; Avoid in chronic liver disease or those with substantial alcohol use
Levomilnacipran	40-80 mg/day	Orthostatic hypotension; monitor blood pressure
Venlafaxine	75-375 mg/day	Sexual dysfunction, QTc prolongation; monitor blood pressure
Venlafaxine XR	75-225 mg/day	Sexual dysfunction, QTc prolongation; monitor blood pressure

## **TRICYCLIC ANTIDEPRESSANTS:**

Tricyclic Antidepressants, or TCAs, work by inhibiting serotonin and norepinephrine transporters, thereby inhibiting presynaptic serotonin and norepinephrine reuptake and increasing concentrations of these neurotransmitters in synaptic clefts. Secondary amines have greater affinity for the norepinephrine transporter, while tertiary amines have greater affinity for the serotonin transporter. In general, secondary amine TCAs are better tolerated than tertiary amines.

TCAs commonly cause sedation, weight gain, sexual dysfunction and anticholinergic effects including blurry vision, urinary retention, dry mouth, constipation, cognitive impairment and delirium. They should be used with caution in individuals with a history of glaucoma. They can lower the seizure threshold in individuals prone to seizures. TCAs should not be stopped abruptly due to discontinuation syndrome. Most TCAs are metabolized by the CYP450 2D6 and their levels can be altered by inducers/inhibitors of that enzyme.

Individuals taking TCAs should be monitored for cardiovascular side effects. TCAs are contraindicated in individuals with a recent myocardial infarction. They are lethal in overdose due to their cardiotoxic effects. They should be used cautiously in individuals with cardiovascular disease or family history of sudden death. Ingesting TCAs with alcohol or sedatives increases the risk of accidental overdose. They are also known to cause orthostatic hypotension, tachycardia and right bundle branch block. ECG monitoring should be performed at baseline and as clinically indicated when TCAs are used in children, in adults over the age of 40, and in those with cardiovascular disease.

TCAs have a narrow therapeutic index and high inter-individual variability. Plasma concentration levels can be used to monitor for adherence and toxicity, although they are less helpful in guiding therapy. See Table 4 below for information about specific TCAs.

**TABLE 4: TRICYCLIC ANTIDEPRESSANTS**

Generic Name	Dosage Range	Comments
Amitriptyline	50-300 mg/day	Tertiary; Active metabolite is nortriptyline; Plasma level range: 100-250ng/mL (amitriptyline + nortriptyline)
Clomipramine	25-250 mg/day	Tertiary; Plasma level range: 230-450ng/mL (clomipramine + norclomipramine)
Desipramine	25-300 mg/day	Secondary; Plasma level range: 50-300ng/mL
Doxepin	3-300 mg/day	Tertiary; Lower doses used for insomnia; Plasma level range: 30-150ng/mL
Imipramine	50-300 mg/day	Tertiary; Active metabolite is desipramine; Plasma level range: 150-250ng/mL (imipramine + desipramine)
Nortriptyline	25-150 mg/day	Secondary; Plasma level range: 50-150ng/mL
Protriptyline*	10-60mg/day	Secondary

\*Plasma level range is not well defined

## **MONOAMINE OXIDASE INHIBITORS:**

Monoamine Oxidase Inhibitors, or MAOIs, irreversibly inhibit the monoamine oxidase enzymes, which are responsible for the metabolism of serotonin, norepinephrine, dopamine, tyramine and other amines. They work by increasing the concentration of serotonin, norepinephrine and dopamine in the synapse. Tranylcypromine also inhibits norepinephrine and dopamine transporters. See Table 5 below for names and dose ranges for MAOIs.

MAOIs are contraindicated in pheochromocytoma, cardiovascular or cerebrovascular disease, hypertension or use of hypertensives and hepatic impairment. They interact with virtually all other classes of antidepressants by causing serotonin syndrome and should never be used in combination with them. One should stop all other antidepressants and allow at least two weeks to elapse (five weeks for fluoxetine) prior to starting treatment with an MAOI. MAOIs should be discontinued at least 10 days before an elective surgery because of concerns with concurrent use with general anesthesia. MAOIs interact with some opioid analgesics that have serotonin reuptake inhibitor activity such as meperidine, tramadol, methadone and dextromethorphan, increasing the risk of serotonin syndrome. MAOIs also interact with stimulants and over-the-counter sympathomimetic decongestants such as pseudoephedrine and phenylephrine; the combination may cause increased blood pressure and should be used with great caution.

As stated above, MAOIs inhibit the breakdown of tyramine which is a derivative of an amino acid found in aged and fermented foods. Consuming tyramine-containing foods while taking an MAOI can lead to dangerous increases in blood pressure and hypertensive crisis. See Table 6 below for details on dietary restrictions while taking on MAOI.

Side effects of MAOIs include postural hypotension, dry mouth, upset stomach, constipation, weight gain, and sexual dysfunction. Starting at a low dose and titrating to therapeutic response may help minimize adverse effects.

**TABLE 5: MONOAMINE OXIDASE INHIBITORS**

Generic Name	Dosage Range	Comments
Phenelzine	45-90 mg/day	Irreversible, non-selective inhibitor of MAO-A and MAO-B
Tranylcypromine	30-60 mg/day	Irreversible, non-selective inhibitor of MAO-A and MAO-B; Inhibits dopamine and norepinephrine transporters
Isocarboxazid	20-60 mg/day	Irreversible, non-selective inhibitor of MAO-A and MAO-B
Selegiline transdermal	6-12 mg/day	Transdermal patch- avoids first pass metabolism

**TABLE 6: MAOI DIETARY RESTRICTIONS\***

Foods To Avoid	Foods Allowed
All matured or aged cheeses	Fresh cottage cheese, cream cheese, ricotta cheese, processed cheese slices, sour cream, yogurt, ice cream
Dried, aged, smoked, fermented, spoiled or improperly stored meat, poultry and fish	Fresh or processed meat, poultry and fish, properly stored pickled or smoked fish
Tap and unpasteurized beer	Canned or bottled beer and alcohol
Broad bean pods, fava beans	All other vegetables and beans
Marmite concentrated yeast extract	Brewer's and baker's yeast
Sauerkraut, kimchee	
Banana peel	Banana pulp, other fruit
Soy sauce, tofu	Peanuts

\* Adapted with permission from Grady MM, Stahl SM. Practical guide for prescribing MAOIs: debunking myths and removing barriers. CNS Spectrums. 2012;17(1):2-10.

**BUPROPION:**

Bupropion is a norepinephrine-dopamine reuptake inhibitor. It is commonly used for depression, smoking cessation and less commonly for Attention Deficit Hyperactivity Disorder. Bupropion can lower the seizure threshold and therefore is contraindicated in anyone who is prone to seizures, including individuals with a known seizure disorder, those with eating disorders or those withdrawing from alcohol or sedative-hypnotics. Similar to SSRIs, bupropion can take anywhere from 4-12 weeks for full antidepressant effect. Common side effects include insomnia, anxiety, headache and increase in sweating. It is less likely to cause sexual side effects compared to SSRIs. See Table 3 for formulations and dosing information.

**MIRTAZAPINE:**

Mirtazapine works by inhibiting alpha<sub>2</sub> receptors which results in increased release of serotonin and norepinephrine. It also antagonizes serotonin receptors 5HT<sub>2</sub>, 5HT<sub>3</sub>, and the histamine receptor, H<sub>1</sub>. It is used in the treatment of depressive disorders. Similar to SSRIs, mirtazapine can take 4-12 weeks for full antidepressant effect. It commonly causes increased appetite, weight gain and sedation and is thus useful when depressive symptoms include lack of appetite, weight loss and insomnia. It is less likely to cause sexual side effects compared to SSRIs. See Table 3 for dosing information. Lower doses tend to be more sedating than higher doses.

**TABLE 3: BUPROPION AND MIRTAZAPINE**

Generic Name	Dosage Range	Comments
Bupropion IR	100-450 mg/day	Three times daily; Single doses >150mg can decrease seizure threshold
Bupropion SR	150-400 mg/day	Twice daily
Bupropion XL	150-450 mg/day	Once daily
Mirtazapine	15-45 mg/day	Weight gain, increased appetite, sedating

**NEFAZODONE AND TRAZODONE:**

Nefazodone and trazodone weakly inhibit serotonin and norepinephrine reuptake, weakly antagonize alpha-1 receptors and are serotonin 5HT<sub>2</sub> receptor antagonists. They are both FDA approved for the treatment of depression. Side effects include sedation, dry mouth, stomach upset and blurry vision.

Nefazodone has been associated with life-threatening hepatic failure and should not be used in anyone with active liver disease. If used, liver function tests should be monitored at baseline and every 3-6 months as clinically indicated. If aspartate aminotransferase (AST) or alanine aminotransferase (ALT) levels reach three times or greater the upper limit of normal, nefazodone should be discontinued. The dose range for nefazodone is 300-600 mg/day.

Trazodone is seldom used as an antidepressant due to its sedating effects. However, it is commonly used as a sleeping agent (refer to *BHS Non Sedative-Hypnotic Treatments of Insomnia Toolkit*). It has the rare potential to cause priapism, a painful, persistent and abnormal penile erection for which individuals should seek immediate emergency care. The dose range for trazodone is 25-100 mg at bedtime when used for sleep and 150-600 mg when used for depression.

## **SPECIAL CONSIDERATIONS FOR USING ANTIDEPRESSANT MEDICATIONS IN CHILDREN AND ADOLESCENTS AND YOUNG ADULTS:**

The use of antidepressant medication in children, adolescents and young adults merits special consideration and monitoring. See the related BHS guideline, *Safer Use of Psychotropic Medications in Children and Adolescents* for additional information about medication use in these specific age groups.

There has been some concern that the use of antidepressant medications themselves may induce suicidal behavior in youths. According to the National Institute of Mental Health (NIMH):

*Following a thorough and comprehensive review of all the available published and unpublished controlled clinical trials of antidepressants in children and adolescents, the U.S. Food and Drug Administration (FDA) issued a black box label warning in October 2004 about an increased risk of suicidal thoughts or behavior (suicidality) in children and adolescents treated with SSRI antidepressant medications. In 2006, an advisory committee to the FDA recommended that the agency extend the warning to include young adults up to age 25.*

*More recently, results of a comprehensive review of pediatric trials conducted between 1988 and 2006 suggested that the benefits of antidepressant medications likely outweigh their risks to children and adolescents with major depression and anxiety disorders. The study, partially funded by NIMH, was published in the April 18, 2007, issue of the Journal of the American Medical Association.*

Some young people respond to antidepressant medication after about two weeks, but for most, the full effect is not seen until four to six weeks or longer. During the first few weeks, the dose is usually increased gradually. For children particular care should be given to start at the lowest possible dose and increase slowly, unless the clinical symptoms or history indicate a different course. Children and families should be informed of the possible risks and side effects of medication and consent for medication must be signed by parents or guardians. Due to the need for more diligent safety observations regarding this black box warning, initial monitoring for children and adolescents starting antidepressant therapy is recommended by the FDA as follows in Table 7:

**TABLE 7: FDA RECOMMENDED MONITORING PARAMETERS FOR CHILDREN AND ADOLESCENTS STARTING SSRI MEDICATION**

Month 1	Patient seen once per week for the first four weeks. Some contacts may be by phone if deemed safe by prescriber.
Month 2	Patient seen every 2 weeks. One contact may be by phone if determined safe by prescriber.
Month 3-12	Patient seen every 1-3 months if symptoms and dose stable. May be more frequent if clinically indicated.
Month 12-Beyond	After 12 months of medication treatment symptom re-assessment should be performed. If symptom free and no previous depressive episodes or extenuating clinical circumstances, consider possibility of medication taper if safe and clinically indicated.

There are only two antidepressant medications FDA approved for the treatment of depression in children and adolescents- see Table 8 for details. While it is recommended that these agents be used as first line, it is common in clinical practice to choose other agents, especially SSRIs or SNRIs based on clinical indicators (i.e. side effect profile, history of symptom response to a different agent, history of first degree family member or patient adverse reaction to these medications, history of other diagnoses that may contraindicate use of these agents).

**TABLE 8: ANTIDEPRESSANTS WITH FDA APPROVAL FOR THE TREATMENT OF DEPRESSION IN CHILDREN AND ADOLESCENTS**

Generic Name	Dosage Range	Comments
Escitalopram	5-20 mg/day	Approved for ages 12+; Well tolerated; QTc prolongation; Fewer drug interactions
Fluoxetine	10-80 mg/day	Approved for ages 8+; Most activating (insomnia, diarrhea, initial increase in anxiety); More drug interactions; Least likely to cause discontinuation syndrome; QTc prolongation

**SPECIAL CONSIDERATIONS FOR USING ANTIDEPRESSANT MEDICATIONS IN OLDER ADULTS:**

Aging may increase the risk of developing side effects from antidepressant medications that otherwise would likely be well-tolerated by a younger adult. This may be due to an enhanced sensitivity to common side effects associated with these drugs – particularly anticholinergic, hypotensive, and sedating effects – and a decreasing capacity to metabolize and eliminate medications in general due to diminished renal or hepatic function. In addition, older adults often have multiple medical comorbidities. As a result, they may be prescribed various medications, introducing the risk for drug interactions. The general approach is to initiate antidepressant therapy at a low dose and titrate to a therapeutic dose with careful monitoring.

The American Geriatrics Society periodically releases updates to the Beers criteria for potentially inappropriate medication use in older adults; the most recent version was released in 2015. Please refer to References and Further Reading section for additional details.

**SPECIAL CONSIDERATIONS FOR USING ANTIDEPRESSANT MEDICATIONS DURING PREGNANCY:**

The FDA classifies drug safety in pregnancy using the following categories: A = controlled studies show no risk; B = no evidence of risk in humans; C = risk cannot be ruled out; D = positive evidence of risk; X = contraindicated in pregnancy. Most antidepressants are categorized as pregnancy category C. One exception is paroxetine which is category D.

The most well studied antidepressants during pregnancy are SSRIs. Meta-analyses on SSRI exposure do not demonstrate an increased risk in congenital malformations in children. However, there have been some reports of an association between first trimester paroxetine exposure and congenital heart defects. Smaller studies on tricyclic antidepressants, bupropion, venlafaxine and mirtazapine have not shown increased risk of congenital malformations. Maternal SSRI use has been associated with a 1% risk of persistent pulmonary hypertension of the newborn in one report, although subsequent studies demonstrated lower risk or no association.

Some studies have suggested that use of SSRIs near the time of delivery may be associated with pre-term birth and poor perinatal outcomes, in particular tremor, restlessness, increased muscle tone and increased crying in about 25% of newborns. These symptoms usually resolve within 1-4 days after delivery. Studies following cohorts of children up to age 7 years concluded that prenatal exposure to SSRIs or tricyclic antidepressants did not have a significant effect on cognitive development, language or behavior.

Discontinuing antidepressants before or during pregnancy increases the risk of symptom relapse. Untreated depression and anxiety are associated with a variety of adverse pregnancy outcomes: low birth weight, fetal growth retardation, pre-term delivery, increased risk of pre-eclampsia and increased risk of delivery complications. Women with untreated mental illness are less likely to receive adequate prenatal

care and are more likely to use alcohol, tobacco and other substances known to adversely affect pregnancy outcomes. The decision of whether or not to continue antidepressants during pregnancy should be carefully considered and individualized, weighing both the risk of untreated mental illness and risks from fetal medication exposure.

#### **SPECIAL CONSIDERATIONS FOR USING ANTIDEPRESSANT MEDICATIONS DURING BREASTFEEDING:**

Antidepressants are considered relatively safe during breastfeeding. Data on SSRIs such as fluoxetine, paroxetine and sertraline and on TCAs suggests that breastfeeding infants have very low to non-detectable amounts of these drugs in their serum. While there have been a small number of case reports of breastfeeding infants experiencing jitteriness, irritability, sleep disturbance, excessive crying and feeding problems, a causal link between medication exposure and these symptoms has been difficult to establish. Serious side effects related to antidepressant exposure in breast milk have not been reported. When selecting an appropriate antidepressant, one should consider choosing an antidepressant for which there are data to support its safety during breastfeeding. However, if a woman responded well to a particular antidepressant in the past or during the course of her pregnancy, it would be reasonable to use that antidepressant while she is breastfeeding. In depth information about specific medications are available on LactMed, a free database available online supported by the National Institute of Health (NIH).

**SPECIAL CONSIDERATIONS FOR RENAL AND HEPATIC IMPAIRMENT:**

The metabolism of antidepressants may be compromised in individuals with renal or hepatic impairment. Depending on the severity of the impairment, antidepressants may require dose adjustments. See Table 9 for general dose adjustment information. Refer to the package insert for additional details for each specific medication.

**TABLE 9: ANTIDEPRESSANT DOSE ADJUSTMENTS IN RENAL AND HEPATIC IMPAIRMENT**

Renal Impairment			Hepatic Impairment		
No Dose Adjustment	Dose Adjustment	Do Not Use	No Dose Adjustment	Dose Adjustment	Do Not Use
Citalopram Escitalopram Fluoxetine Fluvoxamine Sertraline Vilazodone Mirtazapine	Paroxetine Bupropion Desvenlafaxine Venlafaxine Levomilnacipran	Escitalopram (if severe) Duloxetine (if CrCl<30ml/min)	Fluvoxamine (monitor closely) Vilazodone Mirtazapine Levomilnacipran	Citalopram Escitalopram Fluoxetine Paroxetine Sertraline Bupropion Desvenalafxine Venlafaxine	Duloxetine

**WEIGHT GAIN AND METABOLIC RISKS ASSOCIATED WITH ANTIDEPRESSANT USE:**

Antidepressant medications may lead to weight gain. There is increasing evidence that their use may also be associated with the development of metabolic syndrome, a group of conditions associated with heart disease and diabetes. These conditions include:

- Hypertension (high blood pressure)
- Dyslipidemia (elevated cholesterol and triglycerides)
- Elevated blood glucose (high blood sugar)
- Weight gain

At this time there is no consensus on monitoring individuals taking antidepressant medications for conditions associated with metabolic syndrome. Providers should monitor clients as appropriate for each individual situation.

## **APPENDIX 1: SPECIAL CONSIDERATIONS WHEN USING THE SSRI CITALOPRAM**

In 2011, the FDA updated the prescribing information for citalopram based on the risk of QT prolongation and potential to cause *torsades de pointes*. The use of citalopram is **not recommended** in individuals with the following characteristics:

- Congenital long QT syndrome
- Bradycardia (low heart rate)
- Hypokalemia (low potassium)
- Hypomagnesemia (low magnesium)
- Recent acute myocardial infarction (MI)
- Uncompensated heart failure
- Taking other drugs that may prolong the QT interval.

ECG monitoring is recommended in those individuals if the use of citalopram is considered essential. If QTc is persistently > 500ms, FDA recommends discontinuation of citalopram. SFHN BHS recommends using an alternate SSRI in this population or ECG monitoring if citalopram is to be used.

The FDA recommends a **maximum dose of 20mg** for the following individuals: age >60 years, hepatic impairment, known CYP2C19 poor metabolizers, those taking CYP2C19 inhibitors. SFHN BHS recommends considering using no more than 20mg of citalopram in this population.

Patients being considered for citalopram treatment who are at risk for significant electrolyte disturbances should have baseline serum potassium and magnesium measurements with periodic monitoring.

## **APPENDIX 2: STRATEGIES FOR ADDRESSING TREATMENT RESISTANCE WHEN USING ANTIDEPRESSANT MEDICATIONS**

**MEDICATION ADHERENCE:** Adherence to a medication regimen is challenging. Adherence difficulties are common and can significantly reduce the efficacy of antidepressant medication. Therefore, this should be carefully evaluated in all cases of less-than expected treatment response. Strategies to address this are varied and might include: weekly pill boxes or medi-sets, reminders by clients' significant others, and directly observed therapy. Strategies to address adherence should be individually customized for each client.

**MAXIMIZING ANTIDEPRESSANT MEDICATION DOSE:** Maximizing the antidepressant medication dose should be the first strategy employed for symptom reduction after it is determined that medication adherence is not a significant problem. Gradually increase the dose of the current medication to the maximum recommended dose or to the point where the client develops difficulty tolerating the medication, whichever comes first. This strategy should be considered for individuals who are able to tolerate their current antidepressant and have shown some response after a reasonable trial at the current dose.

**SWITCHING ANTIDEPRESSANT MEDICATIONS:** Switching should be considered in cases where individuals cannot tolerate their current antidepressant medication due to side effects, or when there is little to no response after a reasonable trial despite attempts to maximize the dose. Switching can be from one antidepressant medication to another in the same family or from an antidepressant in one family to one in another family. Often during an antidepressant switch, the two medications should be cross-titrated, whereby the new antidepressant is added and the dose gradually raised while the old antidepressant dose is gradually tapered off. Cross titration is not necessary when switching within the family of SSRIs.

**ANTIDEPRESSANT MEDICATION AUGMENTATION:** Augmentation of an antidepressant is defined as adding a non-antidepressant medication to the treatment regimen of an individual taking an antidepressant medication with the goal of improving antidepressant response. There are several antidepressant augmentation medications that have demonstrated possible efficacy: lithium, L-triiodothyronine, buspirone, psychostimulants, and some second generation antipsychotic medications (see the related BHS publication, *Safer Prescribing of Antipsychotic Medications Guideline* for additional information on the use of antipsychotic medications). This strategy might be considered in individuals who have partially responded to the current antidepressant medication, have maximized its dose and in whom switching is contraindicated or not clinically appropriate.

**ANTIDEPRESSANT COMBINATION THERAPY:** Combining two antidepressant medications that each have a different mechanism of action is the final strategy to address treatment resistance. Some combination therapies that have evidence of efficacy include SSRIs/SNRIs with mirtazapine, and SSRIs/SNRIs with bupropion. Like with augmentation, this strategy might be considered in individuals who have partially responded to the current antidepressant medication, have maximized its dose, and in whom switching is contraindicated or not clinically appropriate.

### **APPENDIX 3: OTHER POTENTIAL THERAPIES**

**ELECTROCONVULSIVE THERAPY:** Electroconvulsive therapy (ECT) is a procedure in which an electrical charge is applied to stimulate a seizure in the brain. It is an efficacious treatment for major depressive disorder, with 70-90% of patients demonstrating improvement. Multiple practice guidelines recommend ECT for severe treatment resistant depression, including individuals who have psychotic or catatonic features, those who are acutely suicidal, and those who refuse food. ECT is contraindicated in those with recent myocardial infarction, active bleeding, or any cerebral lesions or hemorrhage. It is considered relatively safe during all trimesters of pregnancy. Side effects include confusion, impaired memory, headache and muscle aches; minimizing ECT dose and using unilateral electrode placement may minimize these side effects.

ECT is available at ZSFG upon referral by sending a secure email to Melissa Nau (Melissa.nau@ucsf.edu) and Jo Ellen Brainin-Rodriguez (Jbrainin-rodriguez@ucsf.edu) or by leaving a message on the ECT referral voicemail at 415-206-2930 which is checked weekly.

**EXERCISE:** Evidence exists for at least a modest improvement in symptoms of depression for people that engage in aerobic exercise or resistance training. The recommendation is at least 30 minutes of moderate exercise every day. Exercise for at least 180 minutes per week or more is moderately more effective than placebo, while exercise for 80 minutes per week or less has a similar effect to placebo. It is reasonable for a patient with mild depression to try exercise as an initial treatment for several weeks and then be re-evaluated. Physical activity can also be recommended as an adjunct to psychotherapy or medication(s).

**HERBAL SUPPLEMENTS:** In contrast to prescription medications, companies that manufacture herbal supplements do not have to seek FDA approval before putting their products on the market. They can state that their products address nutrient deficiencies, support health or are linked to body functions, as long as they include a disclaimer that the FDA has not evaluated the claim. Once an herbal supplement is on the market, the FDA is responsible for monitoring its safety. If a product is found to be unsafe, the FDA can take action against the company and may require the product to be removed from the market.

The regulations surrounding herbal supplements do not guarantee that they are effective or safe for anyone to use. Supplements should be reviewed for possible adverse effects and drug interactions before being cleared for patient use. Most insurance plans do not cover herbal supplements, so individuals may have to pay out-of-pocket if they wish to try them. Table 10 below describes some supplements used for depressive disorders.

**TABLE 10: HERBAL SUPPLEMENTS**

Supplement	Dose Range	Efficacy	Comments
St. John's Wort	300mg three times per day of standardized extract	Modest for mild-to-moderate depression	Drug interactions- use caution with oral contraceptives, warfarin protease inhibitors; Photosensitivity
S-Adenosyl Methionine (SAM-e)	Titrate up to maximum 1600mg/day	Evidence is modest for treatment of depression	Use caution in bipolar patients- potential for causing mood cycling
Folate and L-methylfolate (L-MTF)	Folate: 400mcg/day L-MTF: 7.5-15mg/day	Evidence is limited for use adjunctive to antidepressants	L-MTF is a “medical food” and requires a prescription; Consider checking for folic acid deficiencies
Omega-3 fatty acids: eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA)	1-9 grams/day EPA or EPA/DHA combination	Evidence is limited for use adjunctive to antidepressants	Adverse effects of gastrointestinal upset, diarrhea, constipation

**KETAMINE:** Ketamine acts primarily as an antagonist of the NMDA receptor. It is currently used in medical practice as an anesthetic agent and for acute post-operative pain management. It has also been used as a recreational drug of abuse as high doses produce a side effect of dissociation as well as visual and auditory hallucinations.

In recent years there have been a number of studies indicating promising efficacy of intravenous infusions of ketamine in addressing symptoms of severe, treatment refractory depression. Phase 2 trials are currently underway involving an active metabolite of Ketamine, GLYX-13, which is thought to possess the anti-depressant properties of ketamine with less risk for the dissociative side effects. At this time, ketamine is not routinely used for the treatment of psychiatric disorders, and is only available in select clinical or academic settings.

**CANNIBIS:** At this time, there is insufficient evidence to recommend the use of cannabinoid products in the treatment of depressive or anxiety disorders. Cannabinoids can worsen psychiatric symptoms in some individuals.

## **REFERENCES AND FURTHER READING**

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