DEPARTMENT OF MENTAL HEALTH
PARAMETERS 3.8 FOR USE OF
PSYCHOTROPIC
MEDICATION
IN
CHILDREN
AND
ADOLESCENTS

Treatment provided outside the parametric elements in this guide requires special justification or consultation and subsequent documentation in medical record.

September 19, 2018
INTRODUCTION

The parametric elements of this guide are the dose range and dosage schedule. Doses are expressed by range, and titration to clinical efficacy, and are not specifically calibrated or adjusted for children whose ability to metabolize and excrete these drugs may be compromised. A discussion of metabolic variations largely due to the ethnic/racial/genetic background is beyond the scope of this document. Furthermore, dosing parameters are not expressed by body surface area or in weight adjusted doses.

DMH Parameters 3.8 For Use of Psychotropic Medication for Children and Adolescents, is designed for the use of psychoactive medications for the treatment of diagnosed mental disorders (not exclusively behavioral problems) in children and adolescents, up to 18 years of age, who receive treatment by either directly-operated Los Angeles County Department of Mental Health clinics or the Department’s contracted agencies. The use of psychotropic agents in early childhood is relatively infrequent; the use of such agents in children under the age of three is rare.

(A companion set of parameters regarding the use of psychotropic medications for the treatment of mental disorders is available at http://dmh.lacounty.gov/wps/portal/dmh/clinical_tools/clinical_practice and should be used in conjunction with these parameters.) The intent of this document is to provide a framework for quality management relating to the major classes of psychoactive medications used in children and adolescents. Also, this document serves as a framework by which to develop departmental sponsored training and education for its staff and others.

This document represents a consensus of best practices from among various experts from local training institutions and experienced community-based clinicians who provide treatment to children and adolescents. It is updated periodically to reflect improvements in evidence-based treatments. It is not intended to be a comprehensive treatment document, nor to guide therapy in children whose treatment planning is complicated by the presence of special healthcare needs. Psychosocial treatments which are often the first line of treatment are discussed in other sources. Various source documents that may serve as additional guides are identified in the section of references in this document.

Treatment provided outside of the parametric elements in this guide requires special justification and/or consultation and subsequent relevant documentation of the rationale. Changes in current medication regimens made for the purpose of conforming with this Guide should be initiated only after careful clinical consideration of the basis for the current medication regimen. Treatment noncompliance is a special situation that must be addressed by the prescribing physician; the general health risks inherent in this situation must be considered and the nature and outcome of such deliberations must be clearly documented in the medical record.
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A. Clinical Indications For Use:
1. psychosis
2. mania
3. Tourette's d/o
4. * 2º use in severe behavior d/o with aggression
5. * 2º use in severe hyperactivity

B. Frequency of Dose Change:
As clinically indicated

C. Concomitant Medication Use:
1. Tegretol etc. may lower plasma level
2. avoid >1 antipsychotic at a time
3. avoid anticholinergics with thioridazine

D. Complications & Side Effects:
1. EPS
2. tardive dyskinesia
3. NMS
4. sedation
5. cognitive dulling
6. lowers seizure threshold
7. weight gain
8. hyperprolactinemia**

E. Cautions/Contraindications:
1. liver disease
2. respiratory distress
3. pregnancy
4. breast feeding
5. allergy to drug

F. Medical Work-up:
1. physical exam (incl. ht, wt, BP, P, dyskinesia)
2. lab: fasting serum glucose, fasting lipid panel, LFT's, CBC+differential, UA, BUN, creatinine
3. check for abnormal, involuntary movements

G. Medical Follow-up:
1. for each visit: abnormal movements
2. with each upper titration: BP, P
3. every 6 mos: AIMS, weight, LFT's
4. annual: PE, chemistry panel, CBC+differential, UA
5. for pimozide: EKG @ dose ↑, liver enzymes q 3 mos
6. for thioridazine: periodic EKG's and serum potassium level

<table>
<thead>
<tr>
<th>DRUG</th>
<th>MAIN INDICATIONS</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>SPECIAL CONSIDERATIONS</th>
<th>CONTRAINDICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>chlorpromazine (Thorazine)</td>
<td>psychosis</td>
<td>10 - 800</td>
<td>2-3 x/d</td>
<td>higher risk of sedation/hypotension</td>
<td>see class</td>
</tr>
<tr>
<td>thioridazine (Mellaril)</td>
<td>Only for schizophrenia after other antipsychotics are ineffective</td>
<td>10 - 800</td>
<td>2-3 x/d</td>
<td>higher risk of sedation/hypotension; retinitis pigmentosa</td>
<td>Congenital QT syndrome; QTc interval over 500 msec; cardiac arrhythmias; use of fluvoxamine, propranolol, pindolol, fluoxetine, paroxetine, agents that prolong QTc interval</td>
</tr>
<tr>
<td>fluphenazine (Prolixin)</td>
<td>psychosis</td>
<td>1 - 20</td>
<td>2-3 x/d</td>
<td>-</td>
<td>see class</td>
</tr>
<tr>
<td>perphenazine (Trilafon)</td>
<td>psychosis</td>
<td>2 - 20</td>
<td>2-3 x/d</td>
<td>-</td>
<td>see class</td>
</tr>
<tr>
<td>trifluoperazine (Stelazine)</td>
<td>psychosis</td>
<td>1 - 20</td>
<td>2-3 x/d</td>
<td>-</td>
<td>see class</td>
</tr>
<tr>
<td>haloperidol (Haldol)</td>
<td>psychosis</td>
<td>0.5 - 20</td>
<td>2-3 x/d</td>
<td>-</td>
<td>see class</td>
</tr>
<tr>
<td>thiothixene (Navane)</td>
<td>psychosis</td>
<td>1 - 50</td>
<td>2-3 x/d</td>
<td>-</td>
<td>see class</td>
</tr>
<tr>
<td>loxapine (Loxitane)</td>
<td>psychosis</td>
<td>5 - 150</td>
<td>2-3 x/d</td>
<td>-</td>
<td>see class</td>
</tr>
<tr>
<td>pimozide (Orap)</td>
<td>Tourette's Disorder</td>
<td>1 - 10</td>
<td>1-2 x/d</td>
<td>conduction delays ↑liver enzymes</td>
<td>hx of arrhythmia &amp; use of other drugs that ↑ Q-T</td>
</tr>
</tbody>
</table>

* When standard treatments have been tried and have failed or are contraindicated.
** More so than novel antipsychotics.
SECOND GENERATION ANTIPSYCHOTICS

A. Clinical Indications For Use:
1. psychosis
2. bipolar, mania
3. severe behavior d/o with aggression
4. * 2o use in severe hyperactivity

B. Frequency of Dose Change:
As clinically indicated

C. Concomitant Medication Use:
1. Drugs that lower plasma level: carbamazepine (CBZ), phenytoin (PHT), phenobarbital (PB), smoking
2. Drugs that increase plasma level: fluoxetine, fluvoxamine, paroxetine, macrolide antibiotic, cimetidine
3. Avoid >1 antipsychotic at a time

D. Complications & Side Effects:
1. see relative risks below
2. NMS, TD, withdrawal dyskinesia, EPS

E. Cautions/Contraindications:
1. liver disease, respiratory distress
2. pregnancy & breast feeding
3. avoid concurrent med that ↑QTc (ziprasidone, asenapine)
4. myelosuppression, uncontrolled seizure disorder (clozapine)

F. Medical Work-up:
1. physical exam (incl. ht, wt, BMI, BP, P, dyskinesia)
2. lab: fasting serum glucose, fasting lipid panel, LFT's, CBC+differential, UA, BUN, creatinine
3. check for abnormal, involuntary movements
4. baseline EKG (ziprasidone)

G. Medical Follow-up:
1. each visit: dyskinesias
2. each upper titration: BP, P
3. at least q2mos: wt
4. q6mos: abnormal, involuntary movements, weight, LFT's (Risperdal and Zyprexa), fasting serum glucose, fasting lipid panel
5. annual: PE, CBC+differential, UA
6. for clozapine: Per Protocol
7. for ziprasidone: repeat EKG after increases
8. if rapid weight gain, high risk for DM, and/or below age 7: more frequent monitoring

Relative risk of adverse side effects, from highest to lowest:
• Diabetes/hyperlipidemia/weight gain: clozapine > olanzapine > quetiapine > risperidone = paliperidone = aripiprazole > lurasidone > ziprasidone
• Orthostatic hypotension: clozapine > risperidone = paliperidone > quetiapine > lurasidone > asenapine > olanzapine = aripiprazole > ziprasidone
• Sedation: clozapine > risperidone = paliperidone > lurasidone > asenapine > quetiapine > olanzapine = aripiprazole = ziprasidone
• Hyperprolactinemia: paliperidone > risperidone > olanzapine > ziprasidone, asenapine > quetiapine > lurasidone >> aripiprazole
• EPS: risperidone > paliperidone > lurasidone = aripiprazole = asenapine = ziprasidone > olanzapine >> quetiapine

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**SECOND GENERATION ANTIPSYCHOTICS (Cont'd)**

<table>
<thead>
<tr>
<th>DRUG</th>
<th>Available dosage forms</th>
<th>MAIN INDICATIONS</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>ADVERSE EFFECTS</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>olanzapine (Zyprexa)</strong></td>
<td>tablet (do not crush), rapid-dissolve tab, IM</td>
<td>Psychosis, Bipolar disorder</td>
<td>2.5 - 20</td>
<td>1-2 x/d</td>
<td>weight gain,↑ lipids, ↑ prolactin, ↑ glucose, tachycardia, restlessness, ↑ lipids, ↑ prolactin, ↑ glucose,</td>
<td>high risk of weight gain, diabetes, and hyperlipidemia</td>
</tr>
<tr>
<td><strong>quetiapine (Seroquel)</strong></td>
<td>tab that can be crushed, XR cannot be crushed</td>
<td>Psychosis, Bipolar disorder</td>
<td>25 - 800</td>
<td>1-2 x/d</td>
<td>weight gain,↑ lipids, ↑ prolactin, ↑ glucose, ↑ lipids, ↑ prolactin, ↑ glucose,</td>
<td>least EPS,↑ prolactin, moderate hypotension</td>
</tr>
<tr>
<td><strong>risperidone (Risperdal)</strong></td>
<td>scored tab (crushable), rapid-dissolve tab, soln</td>
<td>Psychosis, Bipolar disorder</td>
<td>0.25 - 8</td>
<td>1-3 x/d</td>
<td>weight gain,↑ lipids, ↑ prolactin, ↑ glucose, tachycardia, restlessness, ↑ lipids, ↑ prolactin, ↑ glucose,</td>
<td>highest EPS, highest ↑ prolactin, moderate hypotension</td>
</tr>
<tr>
<td><strong>clozapine (Clozaril)</strong></td>
<td>tab, rapid-dissolve tab (Fazaclo)</td>
<td>Rx resistant psychosis, Bipolar disorder, tardive dyskinesia, severe EPS</td>
<td>12.5 - 450</td>
<td>1-2 x/d</td>
<td>agranulocytosis, seizures, constipation, hypotension, salivation, wt gain, tachycardia, myocardiitis, ↑ lipids, ↑ glucose,</td>
<td>↑ weight gain, diabetes/hyperlipidemia high sedation, high hypotension, tachycardia, resp. depression</td>
</tr>
</tbody>
</table>

PARAMETERS 3.8 FOR USE OF PSYCHOTROPIC MEDICATION FOR CHILDREN AND ADOLESCENTS – September 19, 2018
<table>
<thead>
<tr>
<th>(Common brand name is indicated for convenience. No preference is implied.)</th>
<th>Parameters</th>
<th>Preferred Dose</th>
<th>Frequency</th>
<th>Side Effects/interactions</th>
<th>Contraindications</th>
</tr>
</thead>
</table>
| **ziprasidone (Geodon)**
Capsule, IM | Psychosis
Bipolar disorder | 20 - 160 | 1-2 x/d | prolongation of QTc | nausea, headache, least wt gain, low EPS low hypotension/sedation, |
| **aripiprazole (Abilify)**
Tab, solution, rapid-dissolve, IM | Psychosis
Bipolar disorder
Aggression/irritability in Autistic D/O
Tourette’s | 2 - 30 | 1 x/d | nausea, vomiting
weight gain, restlessness
psycho-motor activation | nausea, EPS, hypotension & sedation |
| **paliperidone (Invega)**
ER tablet (Do not crush) | Psychosis | 3-12 | 1 x/d | Weight gain, hyperprolactinemia, somnolence, tachycardia, extrapyramidal symptoms, ↑lipids, ↑glucose | >51 kg 3 mg/d; max 12 mg/d
<51 kg 3 mg/d; max 6 mg/d
Active metabolite of risperidone. Limited hepatic metabolism. Potential for ghost tablet in stool. |
| **asenapine (sublingual, Saphris)** | Bipolar disorder | 5-20 | 1 bid | Fatigue, somnolence, dizziness, oral paresthesia, dysguesia | NPO for 10 minutes after admin;
prolongation of QTc |
| **lurasidone (Latuda)**
Schizophrenia (13-17 y.o.)
Bipolar Depression (10-17 y.o.) | 40-80 (Schizophrenia)
20-80 (Bipolar Depression) | 1-2 x/d | dyspepsia, sedation, wt gain, metabolic syndrome, akathisia, nausea, ↑glucose | take with food |

* When standard treatments have been tried and have failed or are contraindicated

** May be used for Tourette’s, tics

□ Very limited pediatric data
### A. Criteria For Use:
1. must demonstrate positive response and tolerability to oral form of medication
2. no history of NMS
3. maintenance antipsychotic therapy
4. prevention of non-compliance related relapse
5. effective medication delivery (if oral/GI delivery is not feasible)
6. insufficient data to support safe use under age 18

### B. Frequency of Injection:
see each medication frequency/Indications

### C. Concomitant Medication Use
1. drugs that lower plasma level:
   - carbamazepine(CBZ), phenytoin(PHT), phenobarbital(PB), smoking
2. drugs that increase plasma level: Fluoxetine, fluvoxamine, Paroxetine, Macrolide Antibiotics
3. avoid >1 injectable antipsychotic therapy at a time

### D. Complications & Side Effects:
**Immediate**
1. sedation or cognitive dulling
2. hypotension, dizziness
3. injection specific complications (sore, scars, infection at injection sites etc.)

**Long Term**
1. NMS, EPS, TD
2. weight gain /obesity / diabetes mellitus II
3. dyslipidemia, hyperprolactinemia

### E. Cautions / Contraindications:
1. allergy to sesame oil (Haldol Decanoate, Prolixin Decanoate)
2. liver disease
3. respiratory distress
4. pregnancy & breast feeding
5. avoid concurrent medications that increase QTc interval
6. fever of unknown origin (need to r/o NMS)

### F. Medical Work-up:
1. physical exam (incl. ht, wt, BP, P, dyskinesia)
2. lab: fasting blood glucose, fasting lipid panel, CBC, LFT, UA
3. EKG (for haloperidol & fluphenazine); repeat when therapeutic dose is established
4. check for abnormal involuntary movements

### G. Medical Follow-up:
1. each visit: dyskinesia, vital signs (BP, pulse)
2. every 6 months: abnormal involuntary movements, weight, LFT’s; fasting glucose & lipid panel
3. annual: PE, CBC, kidney function

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<table>
<thead>
<tr>
<th>Medication</th>
<th>Base / Form</th>
<th>Strength supplied</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>ADVERSE EFFECTS</th>
<th>Peak Plasma Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>haloperidol decanoate</td>
<td>esterified with decanoic acid, (sesame) oil base</td>
<td>50mg / ml</td>
<td>50 - 200</td>
<td>4 weeks</td>
<td>similar to oral haloperidol drowsiness, insomnia, EPS, (less often than oral form), inflammation &amp; nodule at injection site (less common if deltoid used and lower concentration is used)</td>
<td>3-9 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mg / ml</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fluphenazine decanoate; phenothiazine</td>
<td>esterified with decanoic acid, (sesame) oil base</td>
<td>25mg / ml</td>
<td>12.5 - 40</td>
<td>2-4 weeks</td>
<td>similar to oral fluphenazine drowsiness, insomnia, EPS (more frequent with decanoate- up to 50%), dermatological reaction been reported, EKG changes in some patients, hematologic changes within normal variation</td>
<td>first peak at 24 hr, then peaks again in 8-12 days</td>
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<tr>
<td>Risperdal-Consta</td>
<td>encapsulated microspheres, aqueous base</td>
<td>12.5mg / vial</td>
<td>12.5 - 50</td>
<td>2 weeks</td>
<td>similar to oral risperidone drowsiness, insomnia, anxiety reported. akathisia &amp; parkinsonism (7%), hypotension, hyperkinesia (12%), pain, redness, swelling at injection site (&lt;5%)</td>
<td>1% released immediately, the main release begins 3 weeks. Peaks Plasma level in 4-6 weeks</td>
</tr>
<tr>
<td>*must draw up entire vial</td>
<td></td>
<td>25mg / vial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>37.5mg/vial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>50mg / vial</td>
<td></td>
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</tr>
</tbody>
</table>
A. Clinical Indications For Use:  
medication induced extrapyramidal dysfunctions  
(Parkinson's syndrome, dystonia, akathisia, dyskinesia)

B. Frequency of Dose Change:  
1. as clinically indicated  
2. may be withdrawn after a few days to 3 months of  
use to observe for EPS and assess need for use.

C. Concomitant Medication Use:  
1. use only one of this class at a time  
2. avoid use with other parasympatholytic agents  
(TCA's, low potency antipsychotics)

D. Complications & Side Effects:  
1. confusion, disorientation, delirium, hallucinations,  
cognitive dulling, impaired memory  
2. constipation, visual accommodation,  
tachycardia, xerostomia, pupillary dilatation,  
flushed-dry-hot skin, headache, coma, death  
3. worsening of pre-existing psychotic symptoms  
4. aggravation of asthma  
5. abuse potential: may produce a “buzz”  
6. hyperthermia

E. Cautions/Contraindications:  
1. age < 3 y/o  
2. exposure to heat, severe physical stress  
3. closed angle glaucoma  
4. obstructive bowel d/o, megacolon

F. Medical Work-up:  
1. none suggested

G. Medical Follow-up:  
1. as clinically indicated

<table>
<thead>
<tr>
<th>DRUG</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>benztropine (Cogentin)</td>
<td>0.25 - 6</td>
<td>1-2 x/d</td>
<td>available by injection</td>
</tr>
<tr>
<td>trihexyphenidyl (Artane)</td>
<td>0.50 - 6</td>
<td>2-3 x/d</td>
<td>abuse potential</td>
</tr>
</tbody>
</table>

ANTIPARKINSON / ANTICHOLINERGICS

A. Clinical Indications For Use:  
1. Anxiolytic/sedative/hypnotic  
2. allergic reactions  
3. motion sickness

B. Frequency of Dose Change:  
* daily as indicated

C. Complications & Side Effects:  
See Antiparkinson / Anticholinergic

D. Concomitant Medication Use:  
1. avoid use with other parasympatholytic agents (TCA's, low  
potency antipsychotics)  
2. avoid MAOI's  
3. potentiates barbiturates, alcohol, tranquilizers, opiates

E. Cautions/Contraindications:  
1. See Antiparkinson / Anticholinergic  
2. age < 1 y/o

<table>
<thead>
<tr>
<th>DRUG</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>diphenhydramine (Benadryl)</td>
<td>12.5 - 150</td>
<td>1-4 x/d</td>
<td>capsule, tablet, syrup</td>
</tr>
<tr>
<td>hydroxyzine pamoate (Vistaril)</td>
<td>12.5 - 300</td>
<td>1-4 x/d</td>
<td>capsule, tablet, liquid, IM or IV</td>
</tr>
<tr>
<td>hydroxyzine HCl (Atarax)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ANTIHIHISTAMINES

A. Clinical Indications For Use:  
1. Anxiolytic/sedative/hypnotic  
2. allergic reactions  
3. motion sickness

B. Frequency of Dose Change:  
* daily as indicated

C. Complications & Side Effects:  
See Antiparkinson / Anticholinergic

D. Concomitant Medication Use:  
1. avoid use with other parasympatholytic agents (TCA's, low  
potency antipsychotics)  
2. avoid MAOI's  
3. potentiates barbiturates, alcohol, tranquilizers, opiates

E. Cautions/Contraindications:  
1. See Antiparkinson / Anticholinergic  
2. age < 1 y/o

<table>
<thead>
<tr>
<th>DRUG</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>diphenhydramine (Benadryl)</td>
<td>12.5 - 150</td>
<td>1-4 x/d</td>
<td>capsule, tablet, syrup</td>
</tr>
<tr>
<td>hydroxyzine pamoate (Vistaril)</td>
<td>12.5 - 300</td>
<td>1-4 x/d</td>
<td>capsule, tablet, liquid, IM or IV</td>
</tr>
<tr>
<td>hydroxyzine HCl (Atarax)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A. Clinical Indications For Use:
1. Attention-Deficit/Hyperactivity Disorder
2. attention deficit symptoms associated with other mental disorders

B. Frequency of Dose Change:
- No more than two (2) changes in any 7-day period.

C. Concomitant Medication Use:
1. Only one psychostimulant at any one time.
2. No heterocyclic antidepressant unless trials of individual meds have failed
3. No MAO inhibitors

D. Complications & Side Effects:
1. agitation, irritability, hyperactivity
2. exacerbation of obsessions and compulsions
3. insomnia, decreased appetite, weight loss, delayed growth
4. increased heart rate & blood pressure
5. agitation, irritability
6. dyskinetic movements/tics
7. depression or psychosis in high doses
8. withdrawal effect or rebound phenomena

E. Cautions/Contraindications:
1. alcohol or drug abuse
2. anorexia nervosa
3. psychoses
4. severe anxiety
5. hx of cardiovascular disease or family hx of cardiovascular disease, including structural heart defects, or unexplained sudden death

<table>
<thead>
<tr>
<th>DRUG</th>
<th>DURATION OF EFFECT</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEXTROAMPHETAMINE (Dextedrine, Dextrostat, Liquadd)</td>
<td>4-5 hours</td>
<td>2.5 - 40</td>
<td>1-3 x/d</td>
<td>Liquadd avail in liquid form</td>
</tr>
<tr>
<td>AMPHETAMINE SALTS (Adderall)</td>
<td>4-5 hours</td>
<td>2.5 - 60</td>
<td>1-3 x/d</td>
<td>-</td>
</tr>
<tr>
<td>METHYLPHENIDATE (Ritalin, Methylin, Metadate)</td>
<td>4-5 hours</td>
<td>2.5 - 60</td>
<td>1-3 x/d</td>
<td>Methylin avail in liquid form</td>
</tr>
<tr>
<td>DEXMETHYLPHENIDATE (Focalin)</td>
<td>3-5 hours</td>
<td>2.5 - 40</td>
<td>1-3 x/d</td>
<td>-</td>
</tr>
<tr>
<td>METHYLPHENIDATE (Ritalin SR, Metadate ER, Methylin ER)</td>
<td>6-8 hours</td>
<td>2.5 - 60</td>
<td>1-2 x/d</td>
<td>Must be swallowed whole</td>
</tr>
<tr>
<td>METHYLPHENIDATE (Metadate CD)</td>
<td>8-9 hours</td>
<td>10 - 60</td>
<td>Once daily</td>
<td>Sprinkle on food as long as bead swallowed whole</td>
</tr>
<tr>
<td>METHYLPHENIDATE (Ritalin LA) - capsule</td>
<td>8-10 hours</td>
<td>10 - 60</td>
<td>Once daily</td>
<td>Sprinkle on food as long as bead swallowed whole. High fat food may delay absorption</td>
</tr>
<tr>
<td>METHYLPHENIDATE PATCH (Daytrana)</td>
<td>as long as patch applied + up to 3 hours</td>
<td>10 - 30</td>
<td>Once daily for 9 hrs</td>
<td>Skin irritation, remove after 9 hours; persistent loss of skin color (chemical leukoderma)</td>
</tr>
<tr>
<td>METHYLPHENIDATE (Concerta)</td>
<td>8-12 hours</td>
<td>18 - 72</td>
<td>Once daily</td>
<td>Must be swallowed whole. Inert portion of tablet may appear in stool</td>
</tr>
<tr>
<td>METHYLPHENIDATE (Quillivant XR)</td>
<td>8-12 hours</td>
<td>10-60</td>
<td>Once daily</td>
<td>Must be reconstituted with water</td>
</tr>
<tr>
<td>DEXMETHYLPHENIDATE (Focalin XR) - capsule</td>
<td>12 hours</td>
<td>5 - 40</td>
<td>Once daily</td>
<td>Can sprinkle on food as long as bead swallowed whole</td>
</tr>
<tr>
<td>AMPHETAMINE SALTS (Adderall XR) - capsule</td>
<td>10-12 hours</td>
<td>5 - 60</td>
<td>Once daily</td>
<td>Can sprinkle on food as long As bead swallowed whole</td>
</tr>
<tr>
<td>LISDEXAMFETAMINE (Vyvanse)</td>
<td>10-12 hours</td>
<td>20 - 70</td>
<td>Once Daily</td>
<td>Can be dissolved in water to drink immediately</td>
</tr>
</tbody>
</table>

* not to be ingested with citric products
<table>
<thead>
<tr>
<th>DRUG</th>
<th>MAIN INDICATIONS</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>ADVERSE EFFECTS</th>
<th>CAUTIONS/CONTRAINDICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>atomoxetine (Strattera)</td>
<td>ADHD</td>
<td>10 – 100</td>
<td>1-2 x/d</td>
<td>decreased appetite, gastrointestinal sx, palpitations, mood swings, rare hepatoxocity</td>
<td>MAOI's, pressor agents, albuterol, narrow angle glaucoma</td>
</tr>
</tbody>
</table>
A. Clinical Indications For Use:
1. Attention-Deficit/Hyperactivity Disorder
2. agitation, impulsive aggression, impulsivity
3. Tic D/O
4. PTSD

B. Frequency of Dose Change:
- No more than two (2) changes in any 7-day period.

C. Concomitant Medication Use:
1. Only one alpha-adrenergic agonist at any one time.
2. No MAO inhibitors

D. Complications & Side Effects:
1. sedation
2. decreased blood pressure
3. dizziness
4. rebound hypertension on discontinuation
5. constipation
6. headache
7. dry eyes

E. Cautions/Contraindications:
1. pregnancy & breast feeding
2. hx of cardiovascular disease and family hx of cardiovascular disease or unexplained sudden death
3. dosage adjustment for renal insufficiency

F. Medical Work-up:
1. physical exam
2. EKG at baseline if positive cardiac risk factors

G. Medical Follow-up:
1. At each dosage change: orthostatic BP, pulse,
2. annual: physical exam
3. Repeat EKG as clinically indicated

<table>
<thead>
<tr>
<th>DRUG</th>
<th>MAIN INDICATIONS</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>ADVERSE EFFECTS</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>clonidine</td>
<td>see class</td>
<td>0.05 - 0.60</td>
<td>1-4 x/d</td>
<td>—</td>
<td>cautious use in combination with psychostimulants</td>
</tr>
<tr>
<td>(Catapres)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>patch (Catapres)</td>
<td>see class</td>
<td>0.10 - 0.60</td>
<td>1 patch/wk</td>
<td>— localization of dermatitis</td>
<td>cautious use in combination with psychostimulants</td>
</tr>
<tr>
<td>TTS-1, 2 or 3</td>
<td></td>
<td></td>
<td></td>
<td>fatal overdose if ingested</td>
<td></td>
</tr>
<tr>
<td>clonidine extended release (Kapvay)</td>
<td>0.1 – 0.4</td>
<td>bid</td>
<td>URI sx; mood sx; irritability, sore throat, trouble sleeping (insomnia), nightmares, change in mood, and ear pain</td>
<td>adjunctive tx with psychostimulants</td>
<td></td>
</tr>
<tr>
<td>clonidine extended release</td>
<td>see class</td>
<td>1 - 4.0</td>
<td>1-3 x/d</td>
<td>—</td>
<td>cautious use in combination with psychostimulants</td>
</tr>
<tr>
<td>guanfacine</td>
<td>see class</td>
<td>1 - 4.0</td>
<td>1/d</td>
<td>—</td>
<td>cautious use in combination with psychostimulants</td>
</tr>
<tr>
<td>(Tenex)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>guanfacine extended release (Intuniv)</td>
<td>see class</td>
<td>1-4</td>
<td></td>
<td>—</td>
<td>adjunctive tx with psychostimulants</td>
</tr>
</tbody>
</table>
A. Clinical Indications For Use:
1. depressive disorders**
2. ADHD **
3. anxiety disorders
4. enuresis ***

B. Frequency of Dose Change:
   ♦ No more than two (2) changes in any 7-day period

C. Concomitant Medication Use:
   augment with MAOI only if documented failure of single agent

D. Complications & Side Effects:
1. sedation, dizziness, syncope
2. urinary retention, constipation, blurry vision, dry mouth
3. psychosis, mania, delirium
4. EKG changes
5. ↓ seizure threshold
6. wt gain

E. Cautions/Contraindications:
1. heart block
2. allergy to drug/class cross sensitivity
3. narrow angle glaucoma
4. seizure disorder
5. pregnancy & breast feeding
6. overdose may be lethal

F. Medical Work-up:
1. physical exam (incl. ht, wt, BP, P.)
2. lab: liver enzymes, UA
3. EKG at baseline

G. Medical Follow-up:
1. annual: PE
2. EKG at steady state after each dose increase
3. Pulse□, blood pressure□

<table>
<thead>
<tr>
<th>DRUG</th>
<th>MAIN INDICATIONS</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>imipramine (Tofranil)</td>
<td>see class</td>
<td>5 - 300</td>
<td>1-4 x/d</td>
<td>Most well-studied for enuresis in low doses</td>
</tr>
<tr>
<td>desipramine (Norpramin)</td>
<td>see class</td>
<td>10 - 300</td>
<td>1-4 x/d</td>
<td>Most well-studied for ADHD, sudden death reported</td>
</tr>
<tr>
<td>amitriptyline (Elavil)</td>
<td>see class</td>
<td>2.5 - 300</td>
<td>1-4 x/d</td>
<td>High sedation, dry mouth and constipation</td>
</tr>
<tr>
<td>nortriptyline (Pamelor)</td>
<td>see class</td>
<td>10 - 150</td>
<td>1-4 x/d</td>
<td>Least orthostasis, therapeutic blood level 50-150 ng/ml</td>
</tr>
<tr>
<td>doxepin (Sinequan)</td>
<td>see class</td>
<td>10 - 300</td>
<td>1-4 x/d</td>
<td>Highest antihistamine effects</td>
</tr>
<tr>
<td>clomipramine (Anafranil)</td>
<td>see class + OCD</td>
<td>25 - 250</td>
<td>1-4 x/d</td>
<td>Do not use with MAOI; only TCA effective for OCD. Give w/ food to minimize GI upset</td>
</tr>
</tbody>
</table>

* Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults when first started. Depression and other serious mental illnesses are the most important causes of suicidal thoughts and actions.
** generally not considered first line treatment
*** imipramine, amitriptyline
□ If clinically indicated
A. Clinical Indications For Use:
1. depressive disorders
2. obsessive compulsive disorder
3. anxiety disorders
4. bulimia, binge eating disorder
5. impulsive aggression

B. Frequency of Dose Change:
♦ No more than two (2) changes in any 14-day period

C. Concomitant Medication Use:
1. washout period before starting MAOI
   ♦ 5 weeks after fluoxetine
   ♦ 2 weeks after sertraline, fluvoxamine, citalopram
   ♦ 1 week after paroxetine
2. no tryptophan
3. Drug interactions (CYP enzyme and related pharmacokinetics)

D. Complications & Side Effects:
1. agitation, restlessness
2. bipolar (Manic) switching
3. withdrawal symptoms on discontinuation
4. serotonergic syndrome
5. obesity
6. headache
7. sweating
8. sleep disturbance
9. gastrointestinal problems
10. sexual dysfunction

E. Cautions/Contraindications:
1. allergy to drug
2. liver failure
3. pregnancy, breast feeding
4. do not use with MAOI's

F. Medical Work-up:
1. (incl. ht, wt, BP, P.)

G. Medical Follow-up:
♦ ht, wt, BMI at least q 3 mos

<table>
<thead>
<tr>
<th>DRUG</th>
<th>MAIN INDICATIONS</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>fluoxetine (Prozac)</td>
<td>see class</td>
<td>5 - 90</td>
<td>1 x/d</td>
<td>Most activating, dose in am</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High drug interaction risk</td>
</tr>
<tr>
<td>sertraline (Zoloft)</td>
<td>see class</td>
<td>12.5 - 200</td>
<td>1-2 x/d</td>
<td>Moderate drug interaction risk, dose in am or pm</td>
</tr>
<tr>
<td>paroxetine (Paxil)</td>
<td>see class</td>
<td>5 - 60</td>
<td>1-2 x/d</td>
<td>Higher propensity for suicidality, high risk of serotonin withdrawal</td>
</tr>
<tr>
<td>fluvoxamine (Luvox)</td>
<td>see class</td>
<td>25 - 300</td>
<td>1-2 x/d if &gt;100mg/d</td>
<td>Dose at bedtime for improved tolerability, high drug interaction risk</td>
</tr>
<tr>
<td>citalopram (Celexa)</td>
<td>see class</td>
<td>5 - 40</td>
<td>1 x/d</td>
<td>Low drug interaction risk, dose in am or pm; &gt; 40 mg QT prolongation risk increases</td>
</tr>
<tr>
<td>escitalopram (Lexapro)</td>
<td>see class</td>
<td>5 - 20</td>
<td>1 x/d</td>
<td>Low drug interaction risk, dose in am or pm</td>
</tr>
</tbody>
</table>

*Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults during initiation. Higher initial starting doses pose a greater risk of suicidality compared to lower initial starting doses (1% vs 0.5%). Depression and other serious mental illnesses are the most important causes of suicidal thoughts and actions.
### A. Clinical Indications For Use:
1. depressive disorders
2. ADHD (bupropion)
3. anxiety disorders

### B. Frequency of Dose Change:
- No more than two (2) changes in any 7-day period

### C. Concomitant Medication Use:
- Use with MAOI only if documented failure of single agent

### D. Complications & Side Effects:
1. sedation
2. dizziness, syncope

### E. Cautions/Contraindications:
1. allergy to drug
2. uncontrolled seizure disorder (Wellbutrin)
3. eating disorder or active drug/etoh abuse (Wellbutrin)
4. MAOI use (except trazodone)

### F. Medical Work-up:
1. BP (venlafaxine)

### G. Medical Follow-up:
1. BP at least q 3 mos (venlafaxine)

---

<table>
<thead>
<tr>
<th>DRUG (Common brand name is indicated for convenience. No preference is implied.)</th>
<th>MAIN INDICATIONS</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>ADVERSE EFFECTS</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
</table>
| venlafaxine (Effexor) | depression
Anxiety disorders | 12.5 – 225 | 1-3 x/d | Nausea, sustained hypertension (regular monitoring of BP recommended) | Serotonin discontinuation syndrome
Higher propensity for suicidality |
| trazodone (Desyrel) | depression
Insomnia
Anxiety | 25 - 400 | 1-2 x/d | Priapism in males orihostatic hypotension, dizziness, sedation, constipation | Fluoxetine and paroxetine can increase blood level, increasing side effects |
| bupropion (Wellbutrin) bupropion SR, bupropion XL | depression | IR: 75 - 450
Max/dose SR: 100 - 400
Max/dose XL: 150 - 450 | 1-3 x/d | Agitation, headache, insomnia, seizure threshold more than most | Take early in day to prevent insomnia |
| mirtazapine (Remeron) | depression | 7.5 - 45 | 1 x/d | Rare-agranulocytosis, weight gain, hyperlipidemia | 7.5 mg strength not available as oral disintegrating tablet, low drug interaction risk |
| duloxetine (Cymbalta) | anxiety (generalized anxiety disorder) 7-17 y.o. | 30-60 mg
Max: 120 mg | 1 x/d | Dry mouth, fatigue, headache, somnolence, nausea | Monitor blood pressure |

---

*Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults when first started. Depression and other serious mental illnesses are the most important causes of suicidal thoughts and actions.*
A. Clinical Indications For Use:
1. bipolar disorder
2. schizoaffective disorder
3. depression (as adjunctive treatment when antidepressant med alone is not effective)
4. refractory impulsive aggression

B. Frequency of Dose Change:
- See F.2.

C. Concomitant Medication Use:
1. no common rules
2. chronic non-steroidal anti-inflammatory drugs usage can increase blood drug level
3. cautious use of diuretic medication, colchicine

D. Signs of Toxicity:
- lethargy, stupor, confusion, delirium

E. Cautions/Contraindications:
1. BUN > 50, serum creatinine level > 1.5, dehydration, renal, cardiovascular or thyroid disease
2. use of diuretic medication
3. salt free diet

F. Medical Work-up:
1. Wt
2. chemistry panel, CBC, urinalysis
3. TSH
4. consider EKG with multiple medications and relevant Hx and medical conditions

<table>
<thead>
<tr>
<th>DRUG</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>ADVERSE EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>lithium</td>
<td>150 – 2100</td>
<td>1-3 x/d</td>
<td>polyuria, polydipsia, tremor, EPS, nausea, diarrhea, vomiting, ataxia, ↑ WBC dysarthria, change in thyroid &amp; renal function, weight gain</td>
</tr>
</tbody>
</table>

1. at least q6 mos: TSH
2. annual: U/A; serum creatinine

Lithium citrate syrup or solution: sugar-free, raspberry flavored, alcohol 0.3%
A. Clinical Indications For Use:
1. bipolar disorder
2. schizoaffective disorder
3. impulsive aggression

B. Frequency of Dose Change:
♦ No more than one change in any 7-day period

B. Concomitant Medication Use:
♦ no common rules

C. Complications & Side Effects:
♦ lethargy, stupor, confusion, delirium, weight gain except lamotrigine and topiramate

D. Cautions/Contraindications:
1. pregnancy & breast feeding
2. myelosuppression
3. hepatic disease
4. risk of Stevens-Johnson syndrome
5. monitor for suicidality &/or depression
6. acute pancreatitis

E. Medical Work-up:
1. physical exam (incl. ht, wt, BP)
2. chemistry panel, CBC
3. EKG with CBZ

F. Medical Follow-up:
1. each visit: wt
2. annual: PE, chemistry panel, CBC

<table>
<thead>
<tr>
<th>DRUG</th>
<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>ADVERSE EFFECTS</th>
<th>CONTRAINDICATIONS</th>
<th>SPECIAL MEDICAL FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbamazepine (CBZ) (Tegretol) (Equetro) (Carbatrol)</td>
<td>100 - 1200 and/or serum level max 12 mg/ml</td>
<td>2-4 x/d</td>
<td>1. syncope, ataxia, dysarthria, ↑ liver enzymes, bone marrow ↓, skin rash, EKG changes, dizziness, drowsiness, nausea 2. induces liver enzymes 3. (↑ hepatic metabolism esp. estrogen)</td>
<td>1. use of MAOI in last 2 wks 2. history of glaucoma or Sjogren’s disease 3. hypersensitivity to TCA 4. MI in last 6 wks 5. hx of severe ↑ or ↓ BP</td>
<td>1. serum level 5-7 days after dose change 2. q 3 mos: CBC + diff &amp; liver enzymes 3. CBC if rash, sore throat or fever</td>
</tr>
<tr>
<td>valproic acid (VPA) Divalproex sodium (Depakote, Depakote ER)**</td>
<td>125 – 2500 or max serum level max of 125 μg/ml</td>
<td>2-4 x/d</td>
<td>nausea, vomiting, headache, sleep/appetite changes, sedation, tremor, rash, ataxia, visual disturbance, obesity, polycystic ovary disease, fatal pancreatitis, thrombocytopenia</td>
<td>1. congenital metabolic d/o 2. aspirin/barbiturate use 3. age &lt; 2 y/o</td>
<td>1. serum level 5-7 days after dose change 2. q 3 mos.: CBC &amp; liver enzymes</td>
</tr>
<tr>
<td>lamotrigine* (Lamictal)</td>
<td>12.5 – 400</td>
<td>1-2 x/d</td>
<td>benign rash, headache, stomachache, ↑ appetite, insomnia; aseptic meningitis (rare)</td>
<td></td>
<td>Special consideration: carefully adjust valproate/lamotrigine combination, see appendix</td>
</tr>
</tbody>
</table>

** Depakote ER produces 10-20% lower blood levels than regular valproic acid - Depakene syrup alcohol free but not sugar free
Optimal blood draw time for Depakote is 12 hours post-dose - Optimal blood draw time for ER is 20-24 hours post-dose

□ Depression (as adjunctive treatment when antidepressant medication alone is not effective)

△ carbamazepine and valproic acid
ANXIOLYTICS

A. Clinical Indications For Use:
   1. short term: relief of anxiety & some sleep disorders
   2. acute alcohol withdrawal
   3. older adolescents: anxiety, tension, muscle relaxation, sleep disorders
   4. younger children: pavor nocturnis, somnambulism

B. Frequency of Dose Change:
   1. acute care: daily or with each dose
   2. long term Rx: adjust every 4 days

C. Concomitant Medication Use:
   1. potentiated by: phenothiazines, opiates, barbiturates, MAOI's, TCA's, cimetidine
   2. potentiate: hypnotics, sedatives, alcohol
   3. half-life extended by: renal disease, hepatic disease, oral contraceptives, cimetidine, obesity

D. Complications & Side Effects:
   1. CNS depression: fatigue, drowsiness, ataxia, confusion, respiratory depression, death
   2. paradoxical: dyscontrol, disinhibition, excitation, ↑ anxiety, ↑ aggression, rage reaction, hallucinations, insomnia, nightmares

E. Cautions/Contraindications:
   1. substance abuse or dependency
   2. pregnancy

F. Medical Work-up:
   ♦ physical exam (incl. ht, wt, BP, P)

G. Medical Follow-up:
   ♦ as clinically indicated

<table>
<thead>
<tr>
<th>DRUG (Common brand name is indicated for convenience. No preference is implied.)</th>
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<th>ADVERSE EFFECTS</th>
<th>CONTRAINDICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>clonazepam (Klonopin) *</td>
<td>see class</td>
<td>0.125 - 3</td>
<td>1-2 x/d</td>
<td>see class</td>
<td>see class</td>
</tr>
<tr>
<td>alprazolam (Xanax) **</td>
<td>see class</td>
<td>0.25 - 4</td>
<td>3-4 x/d</td>
<td>see class &amp; increased risk of rebound and withdrawal reactions</td>
<td>see class</td>
</tr>
<tr>
<td>lorazepam (Ativan) **</td>
<td>severe adjustment d/o agitation, anxiety</td>
<td>0.25 - 6</td>
<td>3-4 x/d</td>
<td>see class &amp; increased risk of rebound and withdrawal reactions</td>
<td>see class</td>
</tr>
<tr>
<td>buspirone (Buspar)</td>
<td>anxiety, aggression</td>
<td>2.5 - 90</td>
<td>3-4 x/d</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* long acting
** short acting
## COMPLEMENTARY/ALTERNATIVE SUPPLEMENTS

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>melatonin</td>
<td>insomnia</td>
<td>1 - 10</td>
<td>bedtime</td>
<td>dizziness, headaches, intense dreams, abdominal pain</td>
<td>other sedating agents</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>poorly controlled seizures</td>
</tr>
</tbody>
</table>

## BETA-ADRENERGIC BLOCKERS

<table>
<thead>
<tr>
<th>DRUG</th>
<th>MAIN INDICATIONS</th>
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<th>ADVERSE EFFECTS</th>
<th>CAUTIONS/</th>
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</table>

PARAMETERS 3.8 FOR USE OF PSYCHOTROPIC MEDICATION FOR CHILDREN AND ADOLESCENTS – September 19, 2018
<table>
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<th>ADVERSE EFFECTS</th>
<th>CAUTIONS/ CONTRAINDICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>propranolol (Inderal)</td>
<td>aggression, anxiety, PTSD</td>
<td>10 – 40</td>
<td>1-4 x/d</td>
<td>hypotension, bradycardia, depression</td>
<td>bronchospasm disease, cardiovascular disease, diabetes, MAOI, hypothyroidism</td>
</tr>
</tbody>
</table>

(Common brand name is indicated for convenience. No preference is implied.)
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<th>DOSE (mg/d)</th>
<th>DOSAGE SCHEDULE</th>
<th>ADVERSE EFFECTS</th>
<th>CAUTIONS/CONTRAINDICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>nicotine (Nicoderm CQ patch (7mg/24h; 14mg/24h; 21mg/24h))</td>
<td>tobacco use disorder (smoking cessation)</td>
<td></td>
<td>1x/d</td>
<td>consider discontinuation if severe rash or swelling; seizures; abnormal heartbeat or rhythm; difficulty breathing</td>
<td>acute MI within 2 weeks, severe or worsening angina; asthma; hyperthyroidism, pheochromocytoma, hepatic, renal impairment, cardiovascular disease, HTN, insulin dependent diabetes, Hx of seizures and peptic ulcer disease</td>
</tr>
<tr>
<td>naltrexone LAI (Vivitrol)</td>
<td>self-injurious behavior in IDD &amp; autism; also opioid use disorders and alcohol use disorders</td>
<td>25 – 50</td>
<td>1x/d 1-2x/d</td>
<td>sedation</td>
<td>liver dysfunction, concurrent opioids</td>
</tr>
<tr>
<td>N-acetylcysteine</td>
<td>cannabis use disorder</td>
<td>1200</td>
<td>2x/d</td>
<td>abdominal discomfort, headache, nausea</td>
<td>contraindications: seizures, glutathione deficiency, acute asthma</td>
</tr>
<tr>
<td>buprenorphine-naloxone (sublingual tablet, sublingual film, buccal film; suboxone)</td>
<td>opioid withdrawal syndrome and maintenance Tx.</td>
<td>pediatric dosing not available **8/2mg BUP/NAL SL bid</td>
<td>2x/d</td>
<td></td>
<td>hepatic impairment</td>
</tr>
<tr>
<td>bupropion</td>
<td>smoking cessation</td>
<td>IR: 75 - 450</td>
<td>1-3x/d</td>
<td>agitation, headache, insomnia, ∪ seizure threshold more than most</td>
<td>take early in day to prevent insomnia</td>
</tr>
</tbody>
</table>
## APPENDIX

### PHARMACOKINETIC DRUG INTERACTIONS - P450 CYP ENZYME METABOLIZING SYSTEM*

- **Substrate**: a psychotropic drug that is metabolized by a P450 CYP isoenzyme
- **Inhibitor**: coadministration of this drug and any substrate in isoenzyme (3A4, 2D6, 1A2) category would result in ↑ substrate levels
- **Inducer**: coadministration of this drug and any substrate in isoenzyme (3A4, 2D6, 1A2) category would result in ↓ substrate levels

<table>
<thead>
<tr>
<th>3A4</th>
<th>2D6</th>
<th>1A2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substrate</strong></td>
<td><strong>Inhibitor</strong></td>
<td><strong>Inducer</strong></td>
</tr>
<tr>
<td>alprazolam</td>
<td>fluoxetine</td>
<td>phenobarbital</td>
</tr>
<tr>
<td>aripiprazole</td>
<td>fluvoxamine</td>
<td>phenytoin</td>
</tr>
<tr>
<td>carbamazepine</td>
<td>grapefruit juice</td>
<td>rifampin</td>
</tr>
<tr>
<td>clonazepam</td>
<td>macrolide</td>
<td>ritonavir</td>
</tr>
<tr>
<td>eszopiclone</td>
<td>nefazodone</td>
<td>smoking</td>
</tr>
<tr>
<td>guanfacine</td>
<td>ritonavir</td>
<td>St. John’s wort</td>
</tr>
<tr>
<td>nefazodone</td>
<td>oxcarbazepine</td>
<td>carbamazepine</td>
</tr>
<tr>
<td>olanzapine</td>
<td>carbamazepine</td>
<td>aripiprazole</td>
</tr>
<tr>
<td>quetiapine</td>
<td>fluoxetine</td>
<td>atomoxetine</td>
</tr>
<tr>
<td>ritonavir</td>
<td>haloperidol</td>
<td>clozapine</td>
</tr>
<tr>
<td>sertraline</td>
<td>mixed amphetamine</td>
<td>dextroamphetamine</td>
</tr>
<tr>
<td>trazodone</td>
<td>salts</td>
<td>duloxetine</td>
</tr>
<tr>
<td>zaleplon</td>
<td>risperidone</td>
<td>TCA</td>
</tr>
<tr>
<td>zolpidem</td>
<td>TCA</td>
<td>lamotrigine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3A4</th>
<th>2D6</th>
<th>1A2</th>
</tr>
</thead>
<tbody>
<tr>
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<td><strong>Inducer</strong></td>
</tr>
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<td>alprazolam</td>
<td>bupropion</td>
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</tr>
<tr>
<td>carbamazepine</td>
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</tr>
<tr>
<td>clonazepam</td>
<td>fluoxetine</td>
<td>rifampin</td>
</tr>
<tr>
<td>desipramine</td>
<td>haloperidol</td>
<td>ritonavir</td>
</tr>
<tr>
<td>flucainide</td>
<td>paroxetine</td>
<td>TCA</td>
</tr>
<tr>
<td>lamotrigine</td>
<td>valproate</td>
<td>clozapine</td>
</tr>
<tr>
<td>lithium</td>
<td>lurasidone</td>
<td>despiramine</td>
</tr>
<tr>
<td>olanzapine</td>
<td>paliperidone</td>
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</tr>
<tr>
<td>quetiapine</td>
<td>paliperidone</td>
<td>haloperidol</td>
</tr>
<tr>
<td>risperidone</td>
<td>levomepromazine</td>
<td>zotepine</td>
</tr>
<tr>
<td>risperidone</td>
<td>TCA</td>
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</tr>
<tr>
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<td>fluoxetine</td>
<td>fluvoxamine</td>
</tr>
<tr>
<td>ziprasidone</td>
<td>valproate</td>
<td>grapefruit juice</td>
</tr>
<tr>
<td>zolpidem</td>
<td>phenobarbital</td>
<td>smoking</td>
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</tbody>
</table>

### Other Common Mood Stabilizer Pharmacokinetic Drug interactions

<table>
<thead>
<tr>
<th>Interacting drugs</th>
<th>Mechanism</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>lamotrigine &amp; valproate</td>
<td>valproate inhibits glucuronidation</td>
<td>Give ½ lamotrigine dose: monitor more closely for rash.</td>
</tr>
<tr>
<td>valproate &amp; aspirin</td>
<td>aspirin ↑ free valproate levels</td>
<td>Give acetaminophen instead of aspirin.</td>
</tr>
<tr>
<td>lithium &amp; NSAID</td>
<td>NSAID ↓ clearance of lithium</td>
<td>Give acetaminophen instead of NSAID.</td>
</tr>
</tbody>
</table>

* Partial List
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