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.

July 15, 2020

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. Warnings for 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

B. Medical Work-up (Baseline):
1. Physical exam (including height, weight, BMI, BP, pulse, dyskinesia)
2. Lab: fasting blood glucose, Hgb A1c, fasting lipid panel, liver enzymes, CBC + differential, UA, BUN, creatinine
3. Check for abnormal, involuntary movements
4. EKG if at high risk for QTc prolongation

C. Medical Follow-up:
1. Each visit: Abnormal movements, signs/symptoms of hyperprolactinemia, physical exam
2. 2 wks after every dose titration up: Abnormal movements
3. At least every 3 months: AIMS
4. Week 8, week 12 then annually: BMI
5. Week 12 then annually: fasting serum glucose, Hgb A1c, fasting lipid panel, BP, and pulse
6. Annual: Vision screen
7. As clinically indicated: CBC + differential, pregnancy test

Relative risk of adverse side effects, from highest to lowest:	• *EPS:*	haloperidol = fluphenazine > pimozide > perphenazine > chlorpromazine
	• *Hyperprolactinemia:*	haloperidol = fluphenazine > pimozide > perphenazine > chlorpromazine
	• *QTc prolongation:*	pimozide = chlorpromazine > haloperidol = fluphenazine = perphenazine
	• *Sedation:*	chlorpromazine > perphenazine > pimozide = haloperidol = fluphenazine
	• *Orthostatic hypotension:*	chlorpromazine > perphenazine > haloperidol = fluphenazine = pimozide
	• *Diabetes/hyperlipidemia/ weight gain:*	chlorpromazine > haloperidol = perphenazine = fluphenazine = pimozide

DRUG**	CLINICAL INDICATIONS	DOSE^ (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	COMPLICATIONS/ PRECAUTIONS
chlorpromazine (Thorazine®) tablet (can be crushed but with caution for dermatitis), IM injection	Psychosis Not first line in severe behavioral problems d/o with aggression	10 - 800 Max for < 5 y/o: 40 Max for 5-12 y/o: 75	1-6 x/d	- EPS - Sedation - Cognitive dulling - Hypotension - Weight gain - Hyperprolactinemia^^ - Photosensitivity (phenothiazines)	**Contraindications:** Hypersensitivity to sulfites for injection Caution in patients with liver disease Caution in patients with asthma for injection Avoid use of anticholinergics Higher risk of sedation, hypotension	Complications: - Tardive dyskinesia - NMS Precautions: - Blood dyscrasias - Orthostatic hypotension - EKG changes - EEG changes, seizures - Ocular changes - Hyperprolactinemia - Anticholinergic effects - QTc prolongation - Torsades de pointes - Liver disease - Respiratory distress - Pregnancy - Breast feeding
haloperidol (Haldol®) tablet, oral solution, IM injection	Psychosis Tourette Disorder Not first line in severe behavior problems d/o with aggression	0.5 - 15 Max for 3-12 y/o: 0.15mg/kg/day or 6mg/day, whichever is less	2-3 x/d		Higher risk of EPS, hyperprolactinemia	
perphenazine (Trilafon®) tablet	Psychosis	2 - 64	2-4 x		Limited evidence on efficacy and safety for use in age 12 years and younger Use with caution in patients with liver disease Monitor liver function as clinically indicated	
fluphenazine (Prolixin®) tablet, oral solution/elixir, IM injection	Psychosis	1 - 20	2-3 x/d		Limited evidence on efficacy and safety for use in age < 18 Monitor liver enzymes as clinically indicated	

DRUG**	CLINICAL INDICATIONS	DOSE^ (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	COMPLICATIONS/ PRECAUTIONS
pimozide (Orap®) tablet	Tourette Disorder	1-10 Max for 7-12 y/o: 6mg/day or 0.2mg/kg/day, whichever is less Max for ≥ 12 y/o: 10mg/day or 0.2mg/kg/day, whichever is less	1-2 x/d	- Sedation - Cognitive dulling - Hypotension - Weight gain - Hyperprolactinemia^^ - Photosensitivity (phenothiazines)	**Contraindications:** Use of agents that cause tics (methylphenidate, amphetamines), congenital long QT syndrome, history of arrhythmia, hypokalemia, hypomagnesemia, use of other drugs that increase QTc interval, use of fluvoxamine, propranolol, pindolol, fluoxetine, paroxetine (strong CYP2D6 inhibitors), use of strong CYP3A4 inhibitors Monitor: EKG at baseline and each dose increase, liver enzymes at baseline and every 3 months Avoid doses >0.5 mg/kg/day in poor CYP2D6 metabolizers Conduction delays with elevated liver enzymes	Complications: - EPS - Tardive dyskinesia - NMS Precautions: - Blood dyscrasias - Orthostatic hypotension - EKG changes - EEG changes, seizures - Ocular changes - Hyperprolactinemia - Anticholinergic effects - QTc prolongation - Torsades de pointes - Liver disease - Respiratory distress - Pregnancy - Breast feeding

Not included/recommended due to insufficient evidence in youth: **Loxapine (Loxitane), Thiothixene (Navane), Perphenazine (Trilafon)**

* *Not indicated for insomnia*

** *Common brand name is indicated for convenience. No preference is implied.*

^ *Maximum doses based on literature.*

^^ *More so than novel antipsychotics.*

EPS *Extrapyramidal Symptoms*

TD *Tardive Dyskinesia*

NMS *Neuroleptic Malignant Syndrome*

DRESS *Drug Reaction with Eosinophilia and Systemic Symptoms*

AIMS *Abnormal Involuntary Movement Scale*

*SECOND GENERATION ANTIPSYCHOTICS

A. Warnings for 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

B. Medical Work-up (Baseline):
1. Physical exam (including height, weight, BMI, BP, pulse, dyskinesia)
2. Labs: fasting blood glucose, Hgb A1c, fasting lipid panel, liver enzymes, CBC + differential, UA, BUN, creatinine
3. Check for abnormal, involuntary movements
4. Baseline EKG (ziprasidone)

C. Medical Follow-up:
1. Each visit: physical exam
2. Wk 4, 8, 12 then annually: height, weight, BMI (compared against growth chart)
   - If rapid weight gain, high risk for DM, and/or below age 7: need weight management intervention with close monitoring of BG + FLP
3. Two weeks after every dose titration up: BP, Pulse, EPS (rigidity, tremor, akathisia)
4. At least every 3 months: AIMS
5. Wk 12 then annually: fasting blood glucose, Hgb A1c, fasting lipid panel, liver enzymes, CBC + differential, BUN, creatinine (+ prolactin level, as clinically indicated for risperidone)
6. For clozapine: *per protocol*
7. For ziprasidone: repeat EKG after dose increases
8. As clinically indicated: Pregnancy test (females)

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

DRUG NAME** + *Available dosage forms*	CLINICAL INDICATIONS	DOSE*** (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	BOXED WARNING	COMPLICATIONS / PRECAUTIONS
Aripiprazole (Abilify®): tablet, oral solution, oral disintegrating tablet	Psychosis Bipolar disorder, mania / mania with depressive episodes Aggression/irritability in Autistic Spectrum D/O Tourette D/O	2 – 30 Age ≥ 4: Initial 2 Age 4 – 11: Max 15 Age ≥ 12: Max 30 Tourette D/O: Wt < 50 kg: Max 10 Wt ≥ 50 kg: Max 20	1 x/d	Nausea, vomiting weight gain, restlessness, psychomotor activation Higher rates of akathisia	↑ nausea, hypotension	Increased risk of suicidal thoughts and behavior in short-term studies in children, adolescents, and young adults with major depressive D/O and other psychiatric D/O	**Complications:** - NMS - Withdrawal dyskinesis **Precautions:** - Liver disease - Respiratory distress - Pregnancy & breast feeding - Rare cases of DRESS: fever with rash, swollen lymph glands, face swelling → Requires immediate medical attention - Rare, but possible increase in risk of unexplained sudden death → Causality not established yet
Quetiapine (Seroquel®): Tablet (crushable), XR tablet (do not crush)	Psychosis Bipolar disorder, mania	12.5 – 800 Age 5 – 9: Initial 12.5 – 25 Max 400 Age 10 – 17: Initial 25 mg **2x/d** Max 800	1 – 3 x/d XR: 1 x/d	Weight gain, ↑ lipids, ↑ glucose	Least EPS, ↑ prolactin, moderate hypotension XR formulation: Take while fasting or with a light meal (≤ 300 calories meal), preferably in the evening		
Lurasidone (Latuda®): tablet *(brand only)*	Psychosis Bipolar I Depression, monotherapy	20 – 80 Psychosis (13 – 17 y/o): 40 – 80 Bipolar I Depression (10 – 17 y/o): 20 – 80	1 – 2 x/d	Dyspepsia, sedation, wt gain, nausea, ↑ glucose EPS / TD	Take with food (> 350 calorie meal) **Contraindication:** Avoid use with strong CYP3A4 inhibitors/inducers		

*SECOND GENERATION ANTIPSYCHOTICS *(Cont'd)*

DRUG NAME** + *Available dosage forms*	CLINICAL INDICATIONS	DOSE*** (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	BOXED WARNING	COMPLICATIONS / PRECAUTIONS
Clozapine (Clozaril®): tablet, oral disintegrating tablet, oral solution (Versacloz – *brand only*)	Treatment resistant psychosis Bipolar disorder Tardive dyskinesia Severe EPS	6.25 – 600 Age 8 – 11: Initial 6.25 – 12.5 Max 150 – 300 Age ≥ 12: Initial 6.25 – 25 Max 600	1 – 2 x/d	Agranulocytosis, seizures, constipation, salivation, myocarditis Highest risk: wt gain, ↑ lipids, ↑ glucose, sedation, hypotension, tachycardia, respiratory depression	- Consider when patient fails ≥ 2 trials of antipsychotics at adequate dose/duration - Target serum clozapine level of ≥ 350 ng/mL for optimal efficacy **Contraindications:** - Myelosuppression - Uncontrolled seizure disorder	- Severe neutropenia - Seizures - Orthostasis, bradycardia, syncope - Myocarditis, cardiomyopathy - Mitral valve incompetence	**Complications:** - NMS - Withdrawal dyskinesis **Precautions:** - Liver disease - Respiratory distress - Pregnancy & breast feeding - Rare cases of DRESS: fever with rash, swollen lymph glands, swelling of the face → Requires immediate medical attention - Rare, but possible increase in risk of unexplained sudden death → Causality not established yet
Olanzapine (Zyprexa®): tablet, oral disintegrating tablet, IM injection	Psychosis Bipolar disorder	1.25 – 20 Age 4 – 5: Initial 1.25 Max 12.5 Age 6 - 12: Initial 2.5 Max 20 Age ≥ 13: Initial 2.5 – 5 Max 20	1 – 2 x/d	Weight gain, ↑ lipids, ↑ glucose, ↑ prolactin, tachycardia, restlessness EPS / TD	Not recommended to try as first-line treatment option due to high risk of significant weight gain (diabetes, hyperlipidemia)	None related to youth	
Risperidone (Risperdal®): Tablet (crushable), oral disintegrating tablet, oral solution	Psychosis Bipolar disorder, mania / mania with depressive episodes Aggression/irritability in Autistic Spectrum D/O	0.25 – 6 Age 4 – 5: Wt < 20 kg: Initial 0.25 Wt ≥ 20 kg: Initial 0.5 Age ≥ 6: Initial 0.5 Age 4 – 11: Max 3 Age ≥ 12: Max 6	1 – 2 x/d	Weight gain, ↑ lipids, ↑ glucose, ↑ prolactin, tachycardia, restlessness, hypotension (high risk) Highest risk of EPS / TD and hyperprolactinemia			
Paliperidone (Invega®): ER tablet (do not crush)	Psychosis	3 – 12 Age ≥ 12: Initial 3 Wt < 51 kg: Max 6 Wt ≥ 51 kg: Max 12	1 x/d	Weight gain, ↑ lipids, ↑ glucose, ↑ prolactin, somnolence, tachycardia EPS / TD	- Active metabolite of risperidone - Limited hepatic metabolism - Potential for ghost tablet in stool		

*SECOND GENERATION ANTIPSYCHOTICS *(Cont'd)*

DRUG NAME** *+ Available dosage forms*	CLINICAL INDICATIONS	DOSE*** (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	BOXED WARNING	COMPLICATIONS / PRECAUTIONS
Asenapine (Saphris®): sublingual tablet (black cherry flavor – *brand only*)	Bipolar disorder, mania / mania with depressive episodes	5 – 20 Age ≥ 10: Initial 2.5 mg **2x/d** Max 10 mg **2x/d**	2 x/d	Fatigue, somnolence, dizziness, oral paresthesia, dysgeusia EPS / TD	- Nothing by mouth for 10 minutes after administration **Contraindication (CI):** - Severe hepatic impairment (Child-Pugh class C)	None related to youth	**Complications:** - NMS - Withdrawal dyskinesis **Precautions:** - Liver disease - Respiratory distress - Pregnancy & breast feeding - Rare cases of DRESS: fever with rash, swollen lymph glands, swelling of the face → Requires immediate medical attention - Rare, but possible increase in risk of unexplained sudden death → Causality not established yet
Ziprasidone (Geodon®): capsule, IM injection	Psychosis Bipolar disorder	20 – 160 Age 10 – 17: Initial 20 Wt ≤ 45 kg: Max 80 Wt > 45 kg: Max 160	1 – 2 x/d	Nausea, headache, prolongation of QTc EPS / TD	- Take with food (≥ 500 calorie meal) - Lowest risk of: wt gain, EPS, hypotension, sedation **Contraindications (CI):** - Avoid use in patients with congenital long QT syndrome, current/history of QTc prolongation, or CVD/uncompensated heart failure - Avoid use with concurrent med that ↑ QTc		

Not included/recommended due to insufficient evidence in youth: **Iloperidone (Fanapt®)**

Not approved for children/adolescents and insufficient evidence: **Brexpiprazole (Rexulti®), Cariprazine (Vraylar®)**

* *Not indicated for insomnia*

** *Common brand name is indicated for convenience → No preference is implied*

*** *Maximum doses based on literature*

EPS *Extrapyramidal Symptoms*

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NMS *Neuroleptic Malignant Syndrome*

DRESS *Drug Reaction with Eosinophilia and Systemic Symptoms*

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LONG-ACTING ANTIPSYCHOTIC INJECTIONS

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-adherence related relapse
5. Effective medication delivery (if oral/GI delivery is not feasible)
6. Insufficient data to support safe use under age 18

B. Medical Work-up and Follow-up:
Refer to oral formulation of drug

C. Complications/Precautions:
Refer to oral formulation of drug

D. Adverse Effects:
Refer to oral formulation of drug

DRUG	FORMULATION	STRENGTHS SUPPLIED	DOSE (mg/d)	DOSAGE SCHEDULE	PO OVERLAP	SPECIAL CONSIDERATIONS
haloperidol decanoate (Haldol Decanoate®)	esterified with decanoic acid, (sesame) oil base	50 mg/mL 100 mg/mL	50 - 200	4 weeks	3 - 4 weeks	Additional contraindication: Hypersensitivity to sesame oil Similar warnings and side effects as oral haloperidol Less frequent EPS Inflammation & nodule at injection site (less common if deltoid used and lower concentration is used)
fluphenazine decanoate (Prolixin Decanoate®)	esterified with decanoic acid, (sesame) oil base	25 mg/mL	12.5 - 40	2 - 4 weeks	Varies	Additional contraindication: Hypersensitivity to sesame oil Similar warnings and side effects as oral fluphenazine More frequent EPS (up to 50%) due to early peak serum level, dermatological reaction been reported, EKG changes in some patients, hematologic changes within normal variation
risperidone (Risperdal-Consta®)	encapsulated microspheres, aqueous base	12.5 mg/vial 25 mg/vial 37.5 mg/vial 50 mg/vial *must draw up entire vial	12.5 - 50	2 weeks	3 weeks	Similar warnings and side effects as oral risperidone Akathisia & parkinsonism (7%), hyperkinesia (12%), pain, redness, swelling at injection site (<5%)
paliperidone palmitate (Invega Sustenna®)	multi-sized particles in nanosuspension, aqueous base	39 mg/0.25mL 78 mg/0.5mL 117 mg/0.75mL 156 mg/mL 234 mg/1.5 mL	39 - 234	4 weeks	1 - 2 weeks	Need to initiate with 234mg on day 1, then 156mg on day 8 (both loading doses should be given in deltoid) Similar warnings and side effects as oral paliperidone Induration, redness, swelling at injection site (>7%)
aripiprazole monohydrate (Abilify Maintena®)	lyophilized, aqueous base	300 mg 400 mg in prefilled syringes or vials	200 - 400	4 weeks	2 weeks	Similar warnings and side effects as oral aripiprazole Weight gain, akathisia, injection site pain, sedation Usual dose 400mg, but adjusted to 200-300mg if on concurrent CYP3A4/2D6 inhibitors
aripiprazole lauroxil (Aristada®)	non-ester prodrug of aripiprazole, aqueous base	441 mg/1.6 mL662 m g/2.4mL 882 mg/3.2 mL 1064 mg/3.9 mL	441-1064	4 - 8 weeks	3 weeks	Gluteal IM administration only for doses >441 mg Similar warnings and side effects as oral aripiprazole Akathisia, pain, induration, swelling, redness at injection site (<4%)

ANTIPARKINSON / ANTICHOLINERGICS

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, pupilary 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

DRUG (Common brand name is indicated for convenience. No preference is implied.)	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS
benztropine (Cogentin)	0.25 - 6	1-2 x/d	available by injection
trihexyphenidyl (Artane)	0.50 - 6	2-3 x/d	abuse potential

ANTIHISTAMINES

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

F. Medical Work-up:
1. none suggested

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

DRUG (Common brand name is indicated for convenience. No preference is implied.)	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS
diphenhydramine (Benadryl)	12.5 - 150	1-4 x/d	tablet, capsule, liquid, IM or IV
hydroxyzine pamoate (Vistaril) hydroxyzine HCl (Atarax)	12.5 - 300	1-4 x/d	capsule, tablet, syrup

PSYCHOSTIMULANTS

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

E. (cont) Cautions/Contraindications:

6. thyroid disease
7. glaucoma
8. pregnancy & breast feeding
9. allergy to the drug

F. Medical Work-up:

1. physical exam (incl. ht, wt, on graph)
2. EKG at baseline if positive cardiac risk factors

G. Medical Follow-up:

1. BP, pulse: periodic or when clinically indicated
2. periodic: height & weight (graph)
3. annual: physical exam

DRUG (Common brand name is indicated for convenience. No preference is implied.)	DURATION OF EFFECT	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS
SHORT ACTING				
dextroamphetamine (Dexedrine, Dextrostat, Liquadd)	4-5 hours	2.5 - 40	1-3 x/d	Liquadd avail in liquid form
amphetamine salts (Adderall) *	4-5 hours	2.5 - 60	1-3 x/d	-
methylphenidate (Ritalin, Methylin, Metadate)	4-5 hours	2.5 - 60	1-3 x/d	Methylin avail in liquid form
dexmethylphenidate (Focalin)	3-5 hours	2.5 - 40	1-3 x/d	-
INTERMEDIATE ACTING				
methylphenidate (Ritalin SR, Metadate ER, Methlyn ER)	6-8 hours	2.5 - 60	1-2 x/d	Must be swallowed whole
methylphenidate (Metadate CD)	8-9 hours	10 - 60	Once daily	Sprinkle on food as long as bead swallowed whole
methylphenidate (Ritalin LA) - capsule	8-10 hours	10 - 60	Once daily	Sprinkle on food as long as bead swallowed whole. High fat food may delay absorption
LONG ACTING				
methylphenidate patch (Daytrana)	as long as patch applied + up to 3 hours	10 - 30	Once daily for 9 hrs	Skin irritation, remove after 9 hours; persistent loss of skin color (chemical leukoderma)
methylphenidate (Concerta)	8-12 hours	18 - 72	Once daily	Must be swallowed whole. Inert portion of tablet may appear in stool
Methylphenidate (Quillivant XR)	8-12 hours	10-60	Once daily	Must be reconstituted with water.
dexmethylphenidate (Focalin XR) - capsule	12 hours	5 - 40	Once daily	Can sprinkle on food as long as Bead swallowed whole
amphetamine salts (Adderall XR) - capsule	10-12 hours	5 - 60	Once daily	Can sprinkle on food as long As bead swallowed whole
lisdexamfetamine (Vyvanse)	10-12 hours	20 - 70	Once Daily	Can be dissolved in water to drink immediately

** not to be ingested with citric products*

SELECTIVE NOREPINEPHRINE REUPTAKE INHIBITORS

DRUG	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
atomoxetine (Strattera)	ADHD	10 – 100	1-2 x/d	decreased appetite, gastrointestinal sx, palpitations, mood swings, rare hepatoxicity	MAOI's, pressor agents, albuterol, narrow angle glaucoma

ALPHA-ADRENERGIC AGONISTS

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

DRUG (Common brand name is indicated for convenience. No preference is implied.)		MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS
clonidine	(Catapres)	see class	0.05 - 0.60	1-4 x/d	—	cautious use in combination with psychostimulants
	patch (Catapres) TTS-1, 2 or 3	see class	0.10 - 0.60	1 patch/wk	— localized dermatitis fatal overdose if ingested	cautious use in combination with psychostimulants
	extended release (Kapvay)	-	0.1 – 0.4	bid	URI sxs; mood sxs irritability, sore throat, trouble sleeping (insomnia), nightmares, change in mood, and ear pain	adjunctive tx with psychostimulants
guanfacine	(Tenex)	see class	1 - 4.0	1-3 x/d	—	cautious use in combination with psychostimulants
	(Intuniv) extended release	see class	1-4	1/d	—	adjunctive tx with psychostimulants

TRICYCLIC ANTIDEPRESSANTS*

A. Warnings for Concomitant Medication Use:

1. Contraindicated in use with or within 14 days of discontinuing MAOI
2. Risk of serotonin syndrome with linezolid
3. Drugs that cause QT prolongation

C. Medical Work-up:

1. Physical exam (including height, weight, blood pressure, pulse)
2. Labs: CBC + differential, liver enzymes, UA
3. EKG at baseline

D. Medical Follow-up:

1. Annual: Physical exam
2. EKG at steady state after each dose increase
3. As clinically indicated: Pulse, blood pressure, CBC + differential, liver enzymes, pregnancy test (females)

B. Frequency of Dose Change:

No more than two (2) changes in any 7-day period

DRUG NAME** + *Available dosage forms*	CLINICAL INDICATIONS	DOSE*** (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	COMPLICATIONS/ PRECAUTIONS
imipramine (Tofranil®) tablet, capsule	**FDA-approved Indication:** - Enuresis (age ≥ 6) **Other Clinical Use:** Not first line for depressive disorders	25 - 100 Max for 6-12 y/o: 2.5 mg/kg/day Enuresis: Max: 2.5 mg/kg/day or Age 6-11: 50 Age 12: 75	1-4 x/d 1 x/d for capsules	- Sedation - Dizziness - Syncope - Urinary retention - Constipation - Blurry vision - Dry mouth - ↓ seizure threshold - Weight gain	Most well-studied for enuresis in low doses Limited evidence on efficacy and safety for use in age ≤ 12 for depression May convert to imipramine pamoate capsules after reaching 75 mg/day on tablets	**Complications**: - Cardiac conduction abnormalities - Activation of mania/hypomania - Discontinuation syndrome - Overdose may be lethal - Agranulocytosis - Orthostatic hypotension **Precautions**: - Cardiac disease (including family history) - History of suicide attempts - Seizure disorder - Pregnancy - Breast feeding
desipramine (Norpramin®) tablet	Not first line for depressive disorders or ADHD	25 - 150 Max for 6-12 y/o: 3.5 mg/kg/day ADHD (age ≥ 5): Max: 3.5 mg/kg/day	1-4 x/d		Most well-studied for ADHD, sudden death reported Limited evidence on efficacy and safety for use in age ≤ 12 for depression	
amitriptyline (Elavil®) tablet	Enuresis Not first line for depressive disorders	2.5 - 150 Enuresis: Age 6-10: 25 Age ≥ 11: 50	1-4 x/d		Limited evidence on efficacy and safety for use in age ≤ 12 for depression High sedation, dry mouth and constipation	
nortriptyline (Pamelor®) capsules, oral solution	Not first line for depressive disorders	10 - 50	1-4 x/d		Limited evidence on efficacy and safety for use in age ≤ 12 for depression Least orthostasis Therapeutic blood level 60-100 ng/ml	
doxepin (Sinequan®) capsules, tablet, oral solution	Not first line for depressive disorders	10 - 100 Max: 3 mg/kg/day	1-4 x/d		Limited evidence on efficacy and safety for use in age ≤ 12 for depression Highest antihistamine effects Dilute oral solution in 120 mL of water, milk, orange, or tomato juice. Do not dilute in carbonated beverages	
clomipramine (Anafranil®) capsules	**FDA-approved Indication:** - OCD (age ≥ 10)	25 - 200 Max:3 mg/kg/day or 200 mg/d, whichever is smaller	1-4 x/d		Give with food to minimize GI upset	

** Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults when first started. 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. Not treating depression puts children, teenagers, and young adults at higher risk for suicide than treatment with antidepressants.*

*** Common brand name is indicated for convenience. No preference is implied*

**** Maximum doses based on literature*

SELECTIVE SEROTONIN REUPTAKE INHIBITORS*

A. Warnings for Concomitant Medication Use:

1. SSRIs that have a higher potential to increase the therapeutic levels of other medications
   a. fluvoxamine, fluoxetine, paroxetine
2. Contraindicated in use with or within 14 days of discontinuing MAOI
3. Washout period before starting MAOI
   a. 5 weeks after fluoxetine
   b. 2 weeks after sertraline, fluvoxamine, citalopram
   c. 1 week after paroxetine
4. No tryptophan

B. Frequency of Dose Change:

No more than two (2) changes in any 14-day period

C. Medical Work-up (Baseline):

1. Physical exam (including height, weight, BMI, blood pressure, pulse)
2. Lab: Liver enzymes, CBC + differential, UA, TSH
3. Additional labs to consider: vitamin D, B12, folate, zinc, magnesium

D. Medical Follow-up:

1. Annual: physical exam
2. As clinically indicated: CBC + differential, liver enzymes, serum sodium (hyponatremia symptoms), pregnancy test (females), abnormal involuntary movements, signs of abnormal bleeding

DRUG NAME** + Available dosage forms	CLINICAL INDICATIONS	DOSE*** (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	COMPLICATIONS/ PRECAUTIONS
fluoxetine (Prozac®) capsule, oral solution (mint flavor)	**FDA-approved Indications:** - Major depressive disorder (Age ≥ 8) - OCD (Age ≥ 7) **Other Clinical Uses:** - Adjunct with olanzapine in bipolar I disorder (Age ≥ 10) - Panic D/O (Age ≥ 8) - Generalized anxiety disorder (Age ≥ 7) - Social anxiety disorder (Age ≥ 7) - Bulimia nervosa (Age ≥ 12) - Separation anxiety disorder (Age ≥ 9) - Bulimia (Age ≥18)	5 - 60 Age 6 - 11: Initial 5 - 10 Age ≥ 12: Initial 10 Max: 60	1 x/d	- Nausea/Vomiting - Diarrhea - Dry mouth - Dyspepsia - Constipation - Dizziness - Drowsiness - Insomnia - Agitation, restlessness - Weight gain or loss - Anorexia - Headache - Sweating - Sexual dysfunction	Has most efficacy and safety data for use in children and adolescents Higher incidence of insomnia, dose in the morning Higher incidence of weight loss and anorexia	**Complications**: - Activation of mania/hypomania - Discontinuation Syndrome - Abnormal bleeding - Hyponatremia - QTc prolongation (citalopram, escitalopram, sertraline, fluoxetine) - Obesity - Akathisia - Serotonin syndrome (especially with concurrent serotonergic medications) **Precautions:** - Liver disease - Cardiac disease (citalopram, escitalopram, sertraline, fluoxetine) - Pregnancy - Breastfeeding
sertraline (Zoloft®) tablet, oral solution (menthol flavor, must be diluted before use)	**FDA-approved Indications:** - OCD (Age > 6) **Other Clinical uses:** - Major depressive disorder (Age > 6) - Anxiety disorders (social, generalized, and separation anxiety, age > 7) - Panic disorder (Age > 8)	12.5 - 200 Age 6 - 12: Initial 12.5 - 25 Age 13 - 17: Initial 25 - 50 Max: 200	1-2 x/d		Give with food to minimize GI upset and improve absorption Higher incidence of nausea/vomiting and weight gain Caution in urine drug screens, reports of false positives for benzodiazepines in patients receiving sertraline	
paroxetine (Paxil®) tablet, oral suspension (orange flavor)	**Other Clinical Uses:** - OCD, panic disorder (Age > 7) - Social anxiety disorder (Age > 8)	10 - 50	1-2 x/d		Higher propensity for suicidality High risk of discontinuation syndrome, requires a slow taper	

SELECTIVE SEROTONIN REUPTAKE INHIBITORS *(Cont'd)**

DRUG NAME** + Available dosage forms	CLINICAL INDICATIONS	DOSE*** (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	COMPLICATIONS/ PRECAUTIONS
fluvoxamine (Luvox®) tablet, capsule (extended release)	**FDA-approved Indications:** OCD (Age ≥ 8) **Other Clinical Uses:** Anxiety disorders (social, generalized and separation anxiety, age > 6)	25 - 300 Age 8 - 11: Max 200 Age 12 - 17: Max 300	1-2 x/d IR: dose 2 x/d if daily dose >50 mg	- Nausea - Diarrhea - Dry mouth - Dyspepsia - Constipation - Dizziness - Sleep disturbance - Agitation, restlessness - Weight gain or loss - Anorexia - Headache - Sweating - Sexual dysfunction	Dose at bedtime for improved tolerability High drug interaction risk Higher incidence of weight loss, hyperkinesis Higher risk of discontinuation syndrome, requires slower taper	**Complications**: - Activation of mania/hypomania - Discontinuation Syndrome - Abnormal bleeding - Hyponatremia - QTc prolongation (citalopram, escitalopram, sertraline, fluoxetine) - Obesity - Akathisia - Serotonin syndrome (especially with concurrent serotonergic medications) **Precautions:** - Liver disease - Cardiac disease (citalopram, escitalopram, sertraline, fluoxetine) - Pregnancy - Breastfeeding
citalopram (Celexa®) tablet, oral solution (mint flavor)	**Other Clinical Uses:** - Major depressive disorder (Age ≥ 7) - OCD (Age ≥ 6) - Social anxiety disorder (Age ≥ 8)	5 – 40 Age 6 - 11: Initial 10 Age ≥ 12: Initial 20 Max: 40	1 x/d		Lower drug interaction risk QT prolongation risk increases when > 40 mg/day	
escitalopram (Lexapro®) tablet, oral solution (mint flavor)	**FDA-approved Indications:** - Major depressive disorder (Age ≥ 12) **Other Clinical Uses:** - Social anxiety disorder (Age ≥ 10) - Irritability in Autistic disorder (Age ≥ 6)	5 - 20 Age 6 - 11: Initial 5 Max 20 Age ≥ 12: Initial 10 Max 30	1 x/d		Higher incidence of weight gain Lower drug interaction risk	

***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. Not treating depression puts children, teenagers, and young adults at higher risk for suicide than treatment with antidepressants.*

*** Common brand name is indicated for convenience. No preference is implied*

**** Maximum doses based on literature*

SEROTONIN & NOREPINEPHRINE REUPTAKE INHIBITORS*

A. Warnings for Concomitant Medication Use:

1. Contraindicated in use with or within 14 days of discontinuing MAOI
2. Risk of serotonin syndrome with linezolid

B. Frequency of Dose Change:

No more than two (2) changes in any 7-day period

C. Medical Work-up (Baseline):

1. Physical exam (including height, weight, blood pressure, pulse)
2. Labs: Liver enzymes, UA, TSH
3. Additional labs to consider: vitamin D, B12, folate, zinc, magnesium

C. Medical Follow-up:

1. Annual: Physical exam
2. Blood pressure during dosage titration
3. As clinically indicated: Pulse, blood pressure, liver enzymes, pregnancy test (females)

DRUG NAME** + *Available dosage forms*	CLINICAL INDICATIONS	DOSE*** (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	COMPLICATIONS/ PRECAUTIONS
duloxetine (Cymbalta®) delayed-release capsules	**FDA-approved Indications:** - Generalized anxiety disorder (Age ≥ 7) - Fibromyalgia pain (Adolescents)	30 - 60 Max: 120 Fibromyalgia: Max: 60	1-2 x/d	- Headache - Insomnia - Somnolence - Fatigue - Dizziness - Nausea - Dry mouth - Anorexia - Weight loss or gain - Skin reaction	Cymbalta and generic capsules: Swallow whole Drizalma Sprinkle capsules: May open and sprinkle over cool applesauce	**Complications**: - Serotonin discontinuation syndrome - Activation of mania/hypomania - Severe skin reactions - Abnormal bleeding - Hepatotoxicity - Hyponatremia - Elevated blood pressure and pulse - Serotonin syndrome (especially with concurrent serotonergic medications) **Precautions**: - History of suicide attempts - Seizure disorders - Liver disease - Pregnancy - Breastfeeding
venlafaxine (Effexor®) tablets, extended-release tablets, extended-release capsules	Third line for depressive and anxiety disorders	12.5 – 225 Max dose: Wt 20 - 33 kg: 112.5 Wt 34 - 49 kg: 150 Wt ≥ 50 kg: 225	1-3 x/d		Limited evidence on efficacy and safety for use in age <18 for anxiety disorders Higher risk for suicidality, serotonin discontinuation syndrome, nausea, and dose-related hypertension Give w/ food to minimize GI upset Extended-release tabs/caps: Swallow whole	

**Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults when first started. 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. Not treating depression puts children, teenagers, and young adults at higher risk for suicide than treatment with antidepressants.*

*** Common brand name is indicated for convenience. No preference is implied*

**** Maximum doses based on literature*

OTHER ANTIDEPRESSANTS*

A. Warnings for **Concomitant Medication Use:**
1. Contraindicated in use with or within 14 days of discontinuing MAOI
2. Bupropion - Drugs that lower seizure threshold

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

C. Medical Work-up:
1. Physical exam (including height, weight, blood pressure, pulse)
2. Labs: CBC, fasting lipid panel, liver enzymes, UA, TSH
3. Additional labs to consider: vitamin D, B12, folate, zinc, magnesium

D. Medical Follow-up:
1. Annual: Physical exam
2. Blood pressure during dosage titration
3. CBC periodically
4. As clinically indicated: Pulse, blood pressure, liver enzymes, pregnancy test (females)

DRUG NAME** + *Available dosage forms*	CLINICAL INDICATIONS	DOSE*** (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS	COMPLICATIONS/ PRECAUTIONS
bupropion (Wellbutrin®), bupropion SR, bupropion XL tablets	Alternative for ADHD (age ≥ 6) Not first line for depressive disorders	Initial: 3 mg/kg/day Maximum: IR: 6 mg/kg/day or 300, whichever is less SR: 400 XL: 450 Max 200 per dose for IR, SR	IR: 1-3 x/d SR: 2 x/d XL: 1 x/d	- Agitation - Headache - Insomnia - ↓ seizure threshold - Weight loss	**Contraindications:** - Seizure disorder - Eating disorder Limited evidence on dosing and safety for use in age < 18 for depression Take early in day to prevent insomnia	**Complications**: - Activation of mania/hypomania - Discontinuation syndrome **Precautions**: - History of suicide attempts - Active drug/alcohol abuse
mirtazapine (Remeron®) tablets, oral disintegrating tablets (orange flavor, 7.5 mg strength unavailable)	Not first line for depressive disorders	7.5 - 45	1 x/d	- Increased appetite - Drowsiness - Weight gain - Hyperlipidemia	**Complications**: - Agranulocytosis - Liver injury **Precautions**: - Liver disease Limited evidence on efficacy and safety for use in age <18	**Complications**: - Activation of mania/hypomania - Discontinuation syndrome - Abnormal bleeding - Hyponatremia **Precautions**: - History of suicide attempts
trazodone (Desyrel®) tablets	Insomnia Not first line for depressive disorders	25 - 400 Insomnia: Max: 100 Major depression: Max: 6 mg/kg/day	1-2 x/d	- Orthostatic hypotension - Dizziness - Sedation - Constipation	**Complications:** - QT prolongation, risk of sudden cardiac death - Priapism - Cognitive and motor impairment Reports of anxiety, irritability, dysphoria with high levels of trazodone metabolite in adolescents	

***Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults when first started. 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. Not treating depression puts children, teenagers, and young adults at higher risk for suicide than treatment with antidepressants.*

** *Common brand name is indicated for convenience. No preference is implied*

*** *Maximum doses based on literature*

MOOD STABILIZER - lithium

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:

1. 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

G. Medical Follow-up:

1. wt
2. serum levels 5-7 days after each dosage change then q 3-6 mos or more frequently if clinically indicated
3. repeat EKG after therapeutic level achieved
4. at least q 6 mos: TSH
5. annual: U/A; serum creatinine

DRUG (Common brand name is indicated for convenience. No preference is implied.)	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL MEDICAL FOLLOW-UP
lithium	150 – 2100 maximum serum level of 1.5mEq/L	1-3 x/d	polyuria, polydipsia, tremor, EPS, nausea, diarrhea, vomiting, ataxia, ↑ WBC dysarthria, change in thyroid & renal function, weight gain	1.at least q6 mos: TSH 2.annual: U/A; serum creatinine

Lithium citrate syrup or solution: sugar-free, raspberry flavored, alcohol 0.3%

MOOD STABILIZER – anticonvulsants

A. Clinical Indications For Use:

1. bipolar disorder
2. schizoaffective disorder
3. impulsive aggression Δ

B. Frequency of Dose Change:

2. No more than one change in any 7-day period

B. Concomitant Medication Use:

3. 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 Δ

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

DRUG (Common brand name is indicated for convenience. No preference is implied.)	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CONTRAINDICATIONS	SPECIAL MEDICAL FOLLOW-UP
carbamazepine (CBZ) (Tegretol) (Equetro) (Carbatrol)	100 - 1200 and/or serum level max 12 mg/ml	2-4 x/d	1.syncope, ataxia, dysarthria, ↑ liver enzymes, bone marrow ↓, skin rash, EKG changes, dizziness, drowsiness, nausea 2.induces liver enzymes 3.(↑ hepatic metabolism esp. estrogen)	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	1.serum level 5-7 days after dose change 2.q 3 mos: CBC + diff & liver enzymes 3.CBC if rash, sore throat or fever
valproic acid (VPA) Divalproex sodium (Depakote, Depakote ER)**	125 – 2500 or max serum level max of 125 μg/ml	2-4 x/d	nausea, vomiting, headache, sleep/appetite changes, sedation, tremor, rash, ataxia, visual disturbance, obesity, polycystic ovary disease, fatal pancreatitis, thrombocytopenia	1.congenital metabolic d/o 2.aspirin\barbiturate use 3.age < 2 y/o	1.serum level 5-7 days after dose change 2.q 3 mos.: CBC & liver enzymes
lamotrigine* □ (Lamictal)	12.5 – 400	1-2 x/d	benign rash, headache, stomachache, ↑appetite, insomnia; aseptic meningitis (rare)		Special consideration: carefully adjust valproate/lamotrigine combination, see appendix

** *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)*

Δ 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:

4. physical exam (incl. ht, wt, BP, P)

G. Medical Follow-up:

5. as clinically indicated

DRUG (Common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CONTRAINDICATIONS
clonazepam (Klonopin) *	see class	0.125 - 3	1-2 x/d	see class	see class
alprazolam (Xanax) **	see class	0.25 - 4	3-4 x/d	see class & increased risk of rebound and withdrawal reactions	see class
lorazepam (Ativan) **	severe adjustment d/o agitation, anxiety	0.25 - 6	3-4 x/d	see class & increased risk of rebound and withdrawal reactions	see class
buspirone (Buspar)	anxiety, aggression	2.5 - 90	3-4 x/d		

* long acting

** short acting

COMPLEMENTARY/ALTERNATIVE SUPPLEMENTS

DRUG (Common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
melatonin	insomnia	1 - 10	bedtime	dizziness, headaches, intense dreams, abdominal pain	other sedating agents poorly controlled seizures

BETA-ADRENERGIC BLOCKERS

DRUG (Common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
propranolol (Inderal)	aggression anxiety PTSD	10 – 40	1-4 x/d	hypotension bradycardia depression	bronchospasm disease, cardiovascular disease, diabetes, MAOI, hypothyroidism

OPIOID BLOCKERS

DRUG (Common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
naltrexone LAI (Vivitrol)	self-injurious behavior in IDD & autism; also opioid use disorders and alcohol use disorders	25 – 50	1 x/d 1-2x/d	sedation	liver dysfunction, concurrent opioids

ANTI-CRAVING OR PHARMACOTHERAPY FOR SUBSTANCE USE DISORDERS

DRUG (Common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
nicotine (Nicoderm CQ) patch (7mg/24h; 14mg/24h; 21mg/24h)	tobacco use disorder (smoking cessation)		1x/d	consider discontinuation if severe rash or swelling; seizures; abnormal heartbeat or rhythm; difficulty breathing	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
N-acetylcysteine	cannabis use disorder	1200	2x/d	abdominal discomfort, headache, nausea	*contraindications:* seizures, glutathione deficiency, acute asthma
buprenorphine-naloxone (sublingual tablet, sublingual film, buccal film; suboxone)	opioid withdrawal syndrome and maintenance Tx.	pediatric dosing not available **8/2mg BUP/NAL SL bid	2x/d		hepatic impairment
bupropion	smoking cessation	IR: 75 - 450	1-3x/d	agitation, headache, insomnia, ↓seizure threshold more than most	take early in day to prevent insomnia

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

3A4			2D6			1A2		
Substrate	**Inhibitor**	**Inducer**	**Substrate**	**Inhibitor**	**Inducer**	**Substrate**	**Inhibitor**	**Inducer**
alprazolam	fluoxetine	phenobarbital	aripiprazole	bupropion	carbamazepine	amitriptyline	cimetidine	phenobarbital
aripiprazole	fluvoxamine	phenytoin	atomoxetine	cimetidine	phenobarbital	caffeine	ciprofloxacin	phenytoin
carbamazepine	*grapefruit juice*	rifampin	clozapine	duloxetine	phenytoin	clomipramine	duloxetine	rifampin
clonazepam	macrolide	ritonavir	dextroamphetamine	fluoxetine	rifampin	clozapine	fluoxetine	ritonavir
eszopiclone	nefazodone	*smoking*	duloxetine	haloperidol	ritonavir	desipramine	fluvoxamine	*smoking*
guanfacine	ritonavir	St. John's wort	fluphenazine	paroxetine		diazepam	*grapefruit juice*	
lurasidone		oxcarbazepine	haloperidol	ritonavir		haloperidol	isoniazid	
nefazodone		carbamazepine	mixed amphetamine salts	sertraline		imipramine	levofloxacin	
olanzapine			pimozide	TCA			sertraline	
pimozide			risperidone					
quetiapine			TCA					
ritonavir			trazodone					
sertraline			venlafaxine					
trazodone								
zaleplon								
ziprasidone								
zolpidem								

Other Common Mood Stabilizer Pharmacokinetic Drug interactions		
Interacting drugs	**Mechanism**	**Recommendation**
lamotrigine & valproate	valproate inhibits glucuronidation	Give ½ lamotrigine dose: monitor more closely for rash.
valproate & aspirin	aspirin ↑ free valproate levels	Give acetaminophen instead of aspirin.
lithium & NSAID	NSAID ↓ clearance of lithium	Give acetaminophen instead of NSAID.

* Partial List

INDEX

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