Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Ritalin® LA (ER capsule; 50% IR: 50% ER beads)	Age ≥ 6 years: 10-20 mg/day	▪ Age 3-5 years: 22.5 mg/day ▪ Age ≥ 6 years: ○ ≤ 50 kg: 60 mg/day ○ > 50 kg: 100 mg/day	Approved for age ≥ 6 years: 60 mg/day	Once daily in the morning
▪ **Metadate® CD (ER capsule; 30% IR: 70% ER beads), (brand name discontinued)** ▪ **QuilliChew® ER (chewable ER tablet; 30% IR: 70% ER; cherry flavor)**	Age ≥ 6 years: 20 mg/day	▪ Age 3-5 years: 22.5 mg/day ▪ Age ≥ 6 years: ○ ≤ 50 kg: 60 mg/day ○ > 50 kg: 100 mg/day	Approved for age ≥ 6 years: 60 mg/day	Once daily in the morning
Quillivant® XR (ER oral suspension; 20% IR: 80% ER; banana flavor)	Age ≥ 6 years: 20 mg/day	▪ Age 3-5 years: 22.5 mg/day ▪ Age ≥ 6 years: ○ ≤ 50 kg: 60 mg/day ○ > 50 kg: 100 mg/day	Approved for age ≥ 6 years: 60 mg/day	Once daily in the morning - Shake vigorously for at least 10 seconds for accurate dosing
Aptensio® XR (ER capsule; 40% IR: 60% ER)	Age ≥ 6 years: 10 mg/day	▪ Age 3-5 years: 22.5 mg/day ▪ Age ≥ 6 years: ○ ≤ 50 kg: 60 mg/day ○ > 50 kg: 100 mg/day	Approved for age ≥ 6 years: 60 mg/day	Once daily in the morning
Cotempla XR-ODT (25% IR: 75% ER; grape flavor)	Age ≥ 6 years: 17.3 mg/day	Age 6-17 years: 51.8 mg/day	Approved for age ≥ 6 years: 51.8 mg/day	Once daily in the morning
Concerta® (ER osmotic release oral tablet; 22% IR: 78% ER)	Age ≥ 6 years: 18 mg/day	▪ Age 3-5 years: 36 mg/day ▪ Age ≥ 6 years: 72 mg/day	Approved for age ≥ 6 years ▪ Age 6-12 years: 54 mg/day ▪ Age 13-17 years: 72 mg/day or 2 mg/kg/day, whichever is less	Once daily in the morning
Daytrana® TD patch (ER)	Age ≥ 6 years: 10 mg/day	▪ Age 3-5 years: 20 mg/day ▪ Age ≥ 6 years: 30 mg/day	Approved for children ≥ 6 years	Once daily in the morning Note: Patch is designed to be worn for 9 hrs. Removing the patch early leads to a clinical effect, ending 1-3 hours after the patch is removed.

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Jornay PM (ER capsule containing beads with delayed-release coating and extended-release coating); time of onset is approximately 9-10 hours following administration	Age ≥ 6 years: 20 mg once a day given in the EVENING	Age ≥ 6 years: 100 mg once a day given in the EVENING	Approved for children ≥ 6 years: 100mg/day	Once daily in the EVENING Note: This is the ONLY stimulant formulation designed to be administered IN THE EVENING. Recommended time of administration is 8:00pm (range 6:30 pm-9:30pm)

Dexmethylphenidate

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Focalin® (IR tablet)	Age ≥ 6 years: 2.5 mg/daily	Age ≥ 6 years: 50 mg/day	Approved for children ≥ 6 years: 20 mg/day	Twice daily
Focalin® XR (ER capsule; 50% IR: 50% ER beads)	Age ≥ 6 years: 5-10 mg/day	Age ≥ 6 years: 50 mg/day	Approved for children ≥ 6 years: 30 mg/day	Once daily in the morning

Serdexmethylphenidate/ dexmethylphenidate

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Azstarys® long-acting capsule containing dexmethylphenidate IR and the prodrug serdexmethylphenidate	Age ≥ 6 years: 39.2 mg serdexmethylphenidate/ 7.8 mg dexmethylphenidate	Age ≥ 6 years: 52.3 mg serdexmethylphendiate/ 10.4 mg dexmethylphenidate	Approved for age ≥ 6 years: 52.3 mg serdexmethylphendiate/ 10.4 mg dexmethylphenidate	Once daily in the morning

Patient Monitoring Parameters - Stimulants

- Baseline: Assessment using a targeted cardiac history of the child and the family, and a physical examination of the child with an EKG and/or a pediatric cardiology consult as indicated.
- Baseline and ongoing: height, weight, heart rate, and blood pressure.

Boxed Warning - Stimulants

- Abuse potential
- Sudden death and serious cardiovascular events (boxed warning for amphetamine and dextroamphetamine products)

Warnings & Precautions - Stimulants

- Risk of sudden death in those with pre-existing structural cardiac abnormalities or other serious heart problems

- Hypertension
- Potential for psychiatric adverse events (hallucinations, delusional thinking, mania, aggression, etc.)
- Tics
- Decreased appetite and weight
- Sleep disturbance
- Serotonin Syndrome: increased risk when co-administered with serotonergic agents (e.g., SSRIs, SNRIs, triptans)
- Peripheral vasculopathy, including Raynaud's phenomenon, and associated signs and symptoms: instruct patients to report any numbness, pain, or color change in fingers or toes
- Increased adverse effects noted in the 3 - 5-year-old age group
- Amphetamine, dextroamphetamine, lisdexamfetamine: insomnia
- Amphetamine, dextroamphetamine, lisdexamfetamine: Visual disturbances
- Daytrana® TD patch: Post marketing reports of acquired skin depigmentation or hypopigmentation of the skin

Current evidence is unclear regarding a definitive answer as to whether extended use of stimulants leads to a permanent reduction in ultimate adult height: however, a small statistically significant reduction is possible. If mild growth suppression occurs, it is likely reversible upon discontinuation of stimulant.

Other ADHD Treatments

Atomoxetine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Strattera® (oral tablet)	▪ Age ≥ 6 years and weight ≤ 70 kg: 0.5 mg/kg/day ▪ Age ≥ 6 years and weight > 70 kg: 40 mg/day	Age ≥ 6 years: 1.8 mg/kg/day or 100 mg/day, whichever is less	Approved for age ≥ 6 years: 1.4 mg/kg/day or 100 mg/ day, whichever is less	Once or twice daily

Patient Monitoring Parameters - Atomoxetine

- Baseline and ongoing: height, weight, heart rate, and blood pressure.

Closely monitor for clinical worsening or emergence of suicidal thoughts or behaviors. Onset of therapeutic effect is typically 2 - 3 weeks after initiation.

Boxed Warning - Atomoxetine

- Suicidal ideation in children and adolescents being treated for ADHD.

Warnings & Precautions - Atomoxetine

- Potential suicidal thoughts or behaviors
- Severe liver injury
- Contraindicated use within 14 days of an MAOI
- Increased blood pressure and heart rate

- Priapism (rare)

Viloxazine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Qelbree® ER capsule	▪ Age 6-11 years: 100 mg/day ▪ Age 12-17 years: 200 mg/day	Age ≥ 6 years: 400 mg/day	Age ≥ 6 years: 400 mg/day	Once daily

Patient Monitoring Parameters - Viloxazine

- Baseline and ongoing: weight, heart rate, and blood pressure, particularly after a dose increase.
- Screen patient for a personal or family history of suicide, bipolar disorder, or depression. Closely monitor for clinical worsening or emergence of suicidal thoughts or behaviors.
- Onset of therapeutic effect as early as one week after initiation.

Boxed Warning - Viloxazine

- Potential suicidal thoughts and behaviors

Warnings & Precautions - Viloxazine

- Activation of mania/hypomania
- Somnolence/fatigue
- Increased HR and DBP
- Possible ventricular arrhythmias and sudden death in children with risk factors
- Contraindicated to use within 14 days of an MAOI

Clonidine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Catapres® (IR) oral tablet (brand name discontinued)	▪ Age ≥ 6 years and weight ≤ 45 kg: 0.05 mg/day ▪ Age ≥ 6 years and weight > 45 kg: 0.1 mg/day	▪ Age ≥ 6 years AND ○ Weight 27 - 40.5 kg: 0.2 mg/day ○ Weight 40.5 - 45 kg: 0.3 mg/day ○ Weight > 45 kg: 0.4 mg/day	Not approved for treatment of ADHD in children and adolescents	One to four times daily

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Catapres-TTS® Transdermal System; topical patch	▪ Age ≥ 6 years: 0.1 mg/day Patients established on oral dose may be converted to patch that provides equivalent daily dose	▪ Age ≥ 6 years AND ○ Weight 27 - 40.5 kg: 0.2 mg/day ○ Weight 40.5 - 45 kg: 0.3 mg/day ○ Weight > 45 kg: 0.4 mg/day	Not approved for treatment of ADHD in children and adolescents	Apply a new patch once weekly Due to variable absorption in pediatric patients, patch may need to be changed as often as every 5 days
Kapvay® (ER) oral tablet	Age ≥ 6 years: 0.1 mg/day	Age ≥ 6 years: 0.4 mg/day	Approved for monotherapy and adjunctive therapy to stimulants for treatment of ADHD (age 6 - 17 years): 0.4 mg/day	Once or twice daily; swallow ER tablets whole

Guanfacine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Tenex® (IR) oral tablet (Brand name discontinued)	▪ Age ≥ 6 years and weight ≤ 45 kg: 0.5 mg/day ▪ Age ≥ 6 years and weight > 45 kg: 1 mg/day	▪ Age ≥ 6 years AND ○ Weight 27 - 40.5 kg: 2 mg/day ○ Weight 40.5 - 45 kg: 3 mg/day ○ Weight > 45 kg: 4 mg/day	Not approved for children and adolescents	One to four times daily
Intuniv® (ER) oral tablet	Age ≥ 6 years: 1 mg/day	▪ Age 6-12 years: 4 mg/day ▪ Age 13-17 years: 7 mg/day	Approved for monotherapy and adjunctive therapy to stimulants for treatment of ADHD ▪ Age 6-12 years: 4 mg/day ▪ Age 13-17 years: 7 mg/day	Once daily. Do not administer with high fat meals; swallow ER tablets whole.

Patient Monitoring Parameters – Clonidine, Guanfacine

Baseline and ongoing: heart rate and blood pressure. Personal and family cardiovascular history.

Boxed Warning – Clonidine, Guanfacine

None

Warnings & Precautions – Clonidine, Guanfacine

- Hypotension
- Bradycardia
- Cardiac conduction abnormalities
- Syncope
- Sedation/Somnolence

- When tapering, total daily dose should be reduced in decrements of no more than 0.1 mg for clonidine and 1 mg for guanfacine every 3-7 days to avoid rebound hypertension
- See product labeling for information about clinically significant drug interactions
- Do not substitute immediate-release (IR) and extended-release (ER) products on a mg-per-mg basis; if converting from IR guanfacine, discontinue IR treatment and titrate with the ER product per product labeling/prescribing information
- CAUTION IF USED WITH ANTIPSYCHOTICS (decreased BP)
- With clonidine patch, skin irritation, erythema, and rash are common in children

Bupropion

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Wellbutrin® oral tablet (Brand name discontinued)	Age ≥ 6 years: 3 mg/kg/day or 150 mg/day, whichever is less	Age ≥ 6 years: 6 mg/kg/day or 300 mg/day with no single dose > 150 mg, whichever is less	Not approved for children and adolescents	One to three times daily
Wellbutrin® SR oral tablet	Age ≥ 6 years: 3 mg/kg/day or 150 mg/day, whichever is less	400 mg/day	Not approved for children and adolescents	Once or twice daily
Wellbutrin® XL oral tablet	Age ≥ 6 years: 3 mg/kg/day or 150 mg/day, whichever is less	450 mg/day	Not approved for children and adolescents	Once daily

Patient Monitoring Parameters - Bupropion

- Blood pressure and pulse
- Mental status exam and suicide assessment

Boxed Warning - Bupropion

Compared with placebo, increased risk of suicidal thinking and behavior (suicidality) in short-term studies in children and adolescents with major depressive disorder (MDD) and other psychiatric disorders.

Warnings & Precautions - Bupropion

- Lowers seizure threshold; use caution with other agents that may lower seizure threshold; e.g., antipsychotics, TCA's, excessive alcohol
- Discontinuation syndrome: in the absence of serious adverse reactions, taper when discontinuing
- Activation of mania/hypomania
- Suicidal ideation potential
- Contraindicated for use within 14 days of an MAOI

Imipramine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Tofranil® oral tablet/capsule (Brand name discontinued)	Reviewed but not included/recommended			

Tricyclic Antidepressant

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children and Adolescents	Schedule
Multiple Individual medications	Reviewed but not included/recommended			

Boxed Warnings – Imipramine, TCAs

- Increased risk of suicidal thinking and behavior (suicidality) in short-term studies in children and adolescents with major depressive disorder (MDD) and other psychiatric disorders.

Warnings & Precautions – Imipramine, TCAs

- Caution with cardiac disease
- Cardiac conduction abnormalities
- Orthostatic hypotension
- Activation of mania/hypomania
- Anticholinergic and cognitive adverse effects.
- Lowers seizure threshold
- Discontinuation syndrome: in the absence of serious adverse effects, taper when discontinuing.
- Suicidal ideation potential
- Use caution in those with history of suicide attempts; may be cardiotoxic in overdose
- Contraindicated for use within 14 days of an MAOI

Antidepressants – SSRIs

Citalopram

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Celexa® oral tablet** ▪ **Citalopram oral solution; (peppermint flavor), (Brand name solution discontinued)**	▪ Age 6-11 years: 10 mg/day ▪ Age ≥ 12 years: 20 mg/day	Age ≥ 6 years: 40 mg/day	Not approved for children and adolescents	Once daily

Escitalopram

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Lexapro® oral tablet** ▪ **Escitalopram oral solution (peppermint flavor), (Brand name solution discontinued)**	▪ Age 6-11 years: 5 mg/day ▪ Age ≥ 12 years (MDD): 10 mg/day	▪ Age 6-11 years: 20 mg/day ▪ Age ≥ 12 years: 20 mg/day	Not approved for children. ▪ Approved for treatment of MDD in adolescents (age 12-17 years): 20 mg/day ▪ Approved for treatment of Generalized Anxiety Disorder in youth ≥ 7 years: 20 mg/day	Once daily

Fluoxetine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Prozac® oral capsule and oral tablet** ▪ **Fluoxetine oral solution (mint flavor), (Brand name solution discontinued)**	▪ Age 6-11 years: 5-10 mg/day ▪ Age ≥ 12 years: 10 mg/day	Age ≥ 6 years: 60 mg/day	▪ Approved for treatment of MDD (age 8-18 years): 20 mg/day ▪ Approved for treatment of OCD (age 7-17 years): 60 mg/day	Once daily

Paroxetine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Paxil® oral tablet** ▪ **Paxil® oral suspension (orange flavor)** ▪ **Paxil® CR tablet**	Reviewed but not recommended/included – evidence of possible harm			Once daily

Fluvoxamine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Luvox® oral tablet (Brand name discontinued)	Age ≥ 8 years: 25 mg/day	▪ Age 8-11 years: 200 mg/day ▪ Age ≥ 12 years: 300 mg/day	Approved for treatment of OCD (age 8-17 years): ▪ Age 8-11 years: 200 mg/day ▪ Age 12-17 years: 300 mg/day	Daily doses > 50 mg should be divided twice daily
Luvox® CR capsule (Brand name discontinued)	Lowest available dose (100 mg) may not be an appropriate initial dose for pediatric patients	▪ Age 8-11 years: 200 mg/day ▪ Age ≥ 12 years: 300 mg/day	Approved for treatment of OCD (age 8-17 years): ▪ Age 8-11 years: 200 mg/day ▪ Age 12-17 years: 300 mg/day	Once daily

Sertraline

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Zoloft® oral tablet** ▪ **Zoloft® oral solution concentrate; (unflavored, menthol, or mint flavor; varies depending on manufacturer)**	▪ Age 6-12 years: 12.5-25 mg/day ▪ Age ≥ 13 years: 25-50 mg/day	Age ≥ 6 years: 200 mg/day	Approved for treatment of OCD (age 6-17 years): 200 mg/day Solution must be diluted before use, see prescribing information.	Once daily

Vilazodone SSRI and 5-HT1A receptor partial agonist

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Viibryd® oral tablet	Age ≥ 7 years: 5 mg/day and titrated over 2 weeks to 15 mg/day	Age ≥ 7 years: 30 mg/day	Not approved for children and adolescents	Once daily with food

Patient Monitoring Parameters - SSRIs

- Pregnancy test as clinically indicated
- Monitor for emergence of suicidal ideation or behavior
- Monitor weight and growth
- Obtain serum sodium if symptoms of hyponatremia occur (e.g. headaches, confusion, etc.)
- Monitor bone density in patients taking SSRIs longer than 6 months

Boxed Warnings - SSRIs

- Compared with placebo, increased risk of suicidal thinking and behavior (suicidality) in children, adolescents, and young adults in short-term studies of major depressive disorder (MDD) and other psychiatric disorders.

Warnings & Precautions - SSRIs

- Suicidal ideation
- Activation of mania/hypomania
- QTc prolongation potential (citalopram, escitalopram, sertraline, fluoxetine). Avoid citalopram in patients with long QTc interval
- Discontinuation syndrome: except for fluoxetine, SSRIs should be tapered when discontinued, except in cases of serious adverse reactions
- Abnormal bleeding
- Contraindicated to use within 14 days of an MAOI; do not start an MAOI for 5 weeks after fluoxetine discontinuation
- Serotonin Syndrome
- Hyponatremia risk
- Use SSRIs with caution in patients with a seizure disorder

Antidepressants – SNRIs

Venlafaxine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Effexor® oral tablet** ▪ **Effexor® XR capsule and XR tablets**	Reviewed but not included/recommended – evidence of possible harm. In FDA analysis, venlafaxine had the highest risk of potential suicidality of antidepressants studied.			

Duloxetine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Cymbalta® DR capsule** ▪ **Drizalma® Sprinkle DR sprinkle capsule**	Age ≥ 7 years: 30 mg/day	Age ≥ 7 years:120 mg/day	Approved for treatment of GAD (age 7-17 years): 120 mg/day Target dose 30-60 mg/day	Once or twice daily

Desvenlafaxine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Pristiq® ER tablet	Age ≥ 7 years ▪ 20 to < 35 kg: 25 mg/day ▪ 35 to < 70 kg: 35mg/day ▪ ≥ 70 kg: 50mg/day	Age 7-17 years: 50 mg/day	Not approved for children and adolescents	Once daily

Levomilnacipran

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Fetzima® ER capsule	Reviewed but not included/recommended - insufficient evidence Not approved for children and adolescents			

Clomipramine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Anafranil® oral capsule	Age ≥ 10 years: 25 mg/day	Age ≥ 10 years: 3 mg/kg/day or 200 mg/day, whichever is less	Approved for treatment of OCD (age 10-17 years): 3 mg/kg/day or 200 mg/day, whichever is less	Once daily

Patient Monitoring Parameters - SNRIs

- Pregnancy test as clinically indicated
- Monitor for emergence of suicidal ideation or behavior
- Blood pressure during dosage titration and as clinically indicated
- Monitor weight and growth
- Hepatic function testing at baseline and as clinically indicated
- Obtain serum sodium if symptoms of hyponatremia occur (e.g., headaches, confusion, etc.)
- For clomipramine: CBC and EKG at baseline and as clinically indicated

Boxed Warnings - SNRIs

- Compared with placebo, increased risk of suicidal thinking and behavior (suicidality) in children, adolescents, and young adults in short-term studies of major depressive disorder (MDD) and other psychiatric disorders.

Warnings & Precautions - SNRIs

- Suicidal thoughts or behaviors
- Abnormal bleeding
- Severe skin reactions
- Discontinuation syndrome: in the absence of serious adverse reactions, taper when discontinuing

- Activation of mania/hypomania
- Hepatotoxicity
- Serotonin Syndrome
- Seizures
- Hyponatremia
- Weight loss and decreased appetite
- Contraindicated for use within 14 days of an MAOI
- Rare cases of Drug Rash with Eosinophilia and Systemic Symptoms (DRESS)

Antidepressants – Other Mechanisms

Mirtazapine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Remeron® oral tablet (Brand name unavailable)** ▪ **Remeron® Soltab ODT (strawberry-mint or orange flavor; varies depending on manufacturer), (Brand name unavailable)**	Age 7-17 years: 7.5 mg/day	Age ≥ 7 years: 45 mg/day	Not approved for children and adolescents	Once daily in the evening

Vortioxetine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Trintellix® oral tablet	Age 12 - 17 years: 5 mg/day	Maximum dose: 20 mg/day	Not approved for children and adolescents	Once daily

Selegiline

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Emsam® (TD) patch	Age ≥ 12 years: 6 mg per 24 hours	Age ≥ 12 years: 12 mg per 24 hours	Not approved for adolescents and use is contraindicated in children < 12 years	One patch daily

Dextromethorphan/ Bupropion combination

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Auvelity® extended releasetablet	Reviewed but not included/recommended - insufficient evidence Not approved for children and adolescents			

Monoamine oxidase inhibitors (MAOIs) oral formulations

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Multiple individual medications	Reviewed but not included/recommended - increased risk of adverse events possible; risk of safety issues in youth due to drug-food interactions, drug-drug interactions, etc.			

St. John's Wort

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Reviewed but not included/recommended - insufficient evidence				

Patient Monitoring Parameters – Other Antidepressants

- Pregnancy test – as clinically indicated
- Monitor for emergence of suicidal ideation or behavior
- Blood pressure during dosage titration and as clinically indicated
- Monitor weight and height
- Serum cholesterol levels
- CBC baseline and periodically
- Activation of Mania/Hypomania
- Obtain serum sodium if symptoms of hyponatremia occur (e.g., headaches, confusion, etc.).
- Selegiline: Monitor for tyramine induced hypertensive crisis.

Boxed Warning – Other Antidepressants

- Compared with placebo, increased risk of suicidal thinking and behavior (suicidality) in children, adolescents, and young adults in short term studies of major depressive disorder (MDD) and other psychiatric disorders.
- EMSAM is contraindicated in patients less than 12 years of age (due to potential for hypertensive crisis).
- St. John's Wort: No Boxed Warning

Warnings & Precautions – Other Antidepressants

- Suicidal ideation
- Abnormal bleeding
- Increased appetite and weight gain (mirtazapine)
- Discontinuation syndrome: in the absence of serious adverse reactions, taper when discontinuing
- Activation of mania/hypomania
- Orthostatic hypotension and syncope
- Serotonin Syndrome
- Hyponatremia
- Contraindicated for use within 14 days of an MAOI
- Mirtazapine: Rare cases of hepatotoxicity, seizures, and neutropenia/agranulocytosis. If sore throat, fever, stomatitis or signs of infection occur, along with a low WBC, treatment with mirtazapine should be discontinued and the patient should be closely monitored.
- Selegiline TD: tyramine rich foods and beverages should be avoided with doses of selegiline patch ≥ 9 mg per 24 hours
- Auvelity® ER, MAOIs: See individual product prescribing information
- St. John's Wort: Regulated by the FDA as a dietary supplement and not as a medication (no FDA approved indications).
- St. John's Wort: Risk of serotonin syndrome when combined with other serotonergic meds, i.e., SSRIs, SNRIs, other antidepressants, MAOIs, triptans, some opiates, etc.

- St. John's Wort: Significant drug-drug interaction potential
- St. John's Wort: May reduce efficacy of oral contraceptives

Antipsychotics: Second Generation (Atypical)

Aripiprazole

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Abilify® oral tablet** ▪ **Abilify Discmelt® (ODT; vanilla flavor), (Brand name unavailable)** ▪ **Abilify® oral solution (orange flavor), (Brand name unavailable)**	Age ≥ 4 years: 2 mg/day	▪ Age 4-11 years: 15 mg/day ▪ Age ≥12 years: 30 mg/day	▪ Approved for treatment of Bipolar I Disorder associated manic or mixed episodes (10 - 17 years) and Schizophrenia (13 - 17 years): 30 mg/day ▪ Approved for treatment of irritability associated with Autistic Disorder (age 6 - 17 years): 15 mg/day ▪ Approved for Tourette's Disorder (6 - 18 years): ○ weight < 50 kg: 10 mg/day; ○ weight ≥ 50 kg: 20 mg/day	Once daily

Quetiapine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Seroquel® oral tablet** ▪ **Seroquel® XR tablet**	▪ Age 5- 9 years: 12.5 - 25 mg/day ▪ Age ≥ 10 years: 25 mg twice day	▪ Age 5- 9 years: 400 mg/day ▪ Age ≥ 10 years: 800 mg/day	▪ Approved for treatment of Bipolar Mania (age 10 - 17 years): 600 mg/day ▪ Approved for treatment of Schizophrenia (age 13 - 17 years): 800 mg/day	▪ IR: one to three times daily ▪ XR: Once daily preferably in the evening

Olanzapine

Not recommended to start as a first-line treatment option due to risk of significant weight gain and metabolic abnormalities.

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Zyprexa® oral tablet** ▪ **Zyprexa Zydis® (ODT; unflavored, sweetened)**	▪ Age 4 - 5 years: 1.25 mg/day ▪ Age 6 – 12 years: 2.5 mg/day ▪ Age ≥ 13 years: 2.5 - 5 mg/day	▪ Age 4 - 5 years: 12.5 mg/day ▪ Age 6 - 17 years: 20 mg/ day	▪ Approved for treatment of Bipolar Mania or Mixed Episodes Schizophrenia (age 13-17 years): 20 mg/day ▪ Approved for treatment of depressive episodes associated with Bipolar I Disorders (age 10-17 years): 12 mg/day in combination with 50 mg/day fluoxetine	Once daily

Risperidone

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Risperdal® oral tablet** ▪ **Risperdal M-Tab® (ODT; unflavored, sweetened and peppermint flavors; varies depending on manufacturer.) (Brand name unavailable)** ▪ **Risperdal® oral solution; (unflavored)**	▪ Age 4 - 5 years: ○ < 20 kg: 0.25 mg/day ○ > 20 kg: 0.5 mg/day ▪ Age ≥ 6 years: 0.5 mg/day	▪ Age 4 - 11 years: 3 mg/day ▪ Age ≥ 12 years: 6 mg/day	▪ Approved for treatment of Schizophrenia (age 13 - 17 years) and Bipolar Mania or Mixed Episodes (age 10 - 17 years): 6mg/day. ▪ Approved for treatment of irritability associated with autistic disorder (age 5 - 17): 3 mg/day	Once or twice daily

Clozapine

Reserved for treatment-resistant psychosis, following 2 failed trials of antipsychotic medications with adequate dose/duration

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Clozaril® oral tablet** ▪ **FazaClo® (ODT; mint flavor), (Brand name discontinued)** ▪ **Versacloz® oral suspension (unflavored, sweetened), (Only this brand available in liquid susp.)**	▪ Age 8 - 11 years: 6.25 - 12.5 mg/ day ▪ Age ≥ 12 years: 6.25 - 25 mg/day	▪ Age 8 - 11 years: 150 - 300 mg/day ▪ Age ≥ 12 years: 600 mg/day Target serum clozapine level of ≥ 350 ng/mL for optimal efficacy	Not approved for children and adolescents	Once or twice daily

Asenapine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Saphris® (SL tablet; unflavored, sweetened and black cherry flavors; varies depending on manufacturer. NOTE: There is also an asenapine patch (Secuado®), Approved for adults. NOT recommended for children.)	Age ≥ 10 years: 2.5 mg twice daily	Age ≥ 10 years: 10 mg twice daily	Approved for acute treatment of Bipolar Mania and Mixed Episodes (age 10-17 years): 10 mg twice daily	Twice daily; avoid eating or drinking for 10 minutes after sublingual administration.

Iloperidone

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Fanapt® oral tablet	Reviewed but not included/recommended - insufficient evidence Not approved for children and adolescents			

Paliperidone

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Invega® extended release tablet	Adolescent (age ≥ 12 years): 3 mg/day	Schizophrenia; Age ≥ 12 years: ▪ Weight < 51 kg: 6 mg/day ▪ Weight ≥ 51 kg: 12 mg/day	Approved for treatment of Schizophrenia (age 12-17 years): ▪ Weight < 51 kg: 6 mg/day ▪ Weight ≥ 51 kg: 12 mg/day	Once daily

Ziprasidone

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Geodon® oral capsule	Age ≥10 years: 20 mg/day	Bipolar Disorder (age ≥ 10 years): ▪ Weight ≤ 45 kg: 80 mg/day ▪ Weight > 45 kg: 160 mg/day	Not approved for children and adolescents	Twice daily; take with ≥ 500 calorie meal

Lurasidone

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Latuda® oral tablet	▪ Bipolar I Depression (age ≥ 10 years): 20 mg/day ▪ Schizophrenia (age ≥ 13 years): 40 mg/day	Age ≥ 10 years: 80 mg/day	Approved for treatment of Schizophrenia (age 13 - 17 years) and Bipolar I Disorder, depressed phase, as monotherapy (age 10 -17 years): 80 mg/day	Once daily with > 350 calorie meal

Brexpiprazole

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Rexulti® oral tablet	Age ≥ 13 years: 0.5 mg	Schizophrenia (age ≥ 13 years): 4mg/day	Approved for treatment of Schizophrenia (age 13 - 17 years): 4 mg/day	Once daily

Cariprazine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Vraylar® oral capsule	Age ≥ 10 years: 1.5 mg/day	▪ Schizophrenia (age 13-17 years): 4.5 mg/day ▪ Bipolar I disorder (age 10- 17 years): 4.5 mg/day	Not FDA approved in children and adolescents	Once daily

Lumateperone

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Caplyta® oral capsule	Reviewed but not included/recommended - insufficient evidence Not approved for children and adolescents			

Combination Antipsychotic-Antidepressant Formulation(s)

Olanzapine/Fluoxetine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Symbyax® oral capsule	Age ≥ 10 years: 3mg olanzapine/ 25mg fluoxetine	Age 10 - 17 years:12mg olanzapine/ 50mg fluoxetine per day	Acute Depressive Episodes Associated with Bipolar I Disorder (age 10 - 17 years): 12 mg olanzapine/ 50mg fluoxetine	Once daily in the evening

Patient Monitoring Parameters – Second Generation (Atypical)

- Fasting plasma glucose level or HbA1c – at baseline, at 12 – 16 weeks, then annually
- Lipid screening - at baseline, at 12 - 16 weeks, and as clinically indicated
- Blood pressure, pulse – at baseline, 12 weeks, and annually
- Cariprazine: monitor blood pressure during titration and periodically
- Weight (BMI) – at baseline, at 4 weeks, at 8 weeks, 12 weeks, and annually. BMI should be compared against growth charts. www.cdc.gov/growthcharts
- Weight gain exceeding 90th percentile for age or a change of 5 BMI units for youths obese at treatment initiation should have weight management intervention and increased frequency of glucose and lipid monitoring.
- CBC as clinically indicated
- Pregnancy test – as clinically indicated
- EPS evaluation (examination for rigidity, tremor, akathisia) – before initiation of any antipsychotic medication, then weekly for the first 2 weeks after initiating treatment with a new antipsychotic or until the dose has been stabilized, and weekly for 2 weeks after a dose increase.
- Tardive Dyskinesia. Evaluation AIMS or DISCUS at regular intervals throughout treatment (at least every 12 months).
- Sexual function– inquire for evidence of galactorrhea/ gynecomastia, menstrual disturbance, libido disturbance or erectile/ ejaculatory, disturbances in males (priapism has been reported with SGAs); This inquiry should be done at each visit for the first 12 months and at least annually thereafter.
- Vision questionnaire – ask whether the patient has experienced a change in vision and should specifically ask about distance vision and blurry vision-yearly.
- Cardiovascular – obtain family history at baseline. In patients with family history of cardiac abnormalities or sudden death, personal history of syncope, palpitations, or cardiovascular abnormalities, baseline EKG and subsequent monitoring is recommended.
- For patients with resting HR > 130 bpm, PR interval > 200 msec, QRS > 120 msec, or QTc > 460 msec, consider alternate therapy (AACAP Practice Parameter for the use of atypical antipsychotic medications in children and adolescents 2011)

- Clozapine: Clozapine is associated with severe neutropenia (absolute neutrophil count (ANC) less than 500/µL). The requirements to prescribe, dispense, and receive clozapine are incorporated into a single, shared program called the Clozapine Risk Evaluation and Mitigation Strategy (REMS). Must follow specific requirements for CBC monitoring as per product labeling and clozapine REMS website. Prescribers and pharmacies must certify the use of Clozapine at www.clozapinerems.com. See FDA approved label for guidance regarding use in patients with Benign Ethnic Neutropenia.
- Olanzapine/fluoxetine: Please also see SSRI monitoring parameters

Boxed warnings – Second Generation (Atypical)

- Aripiprazole, quetiapine, lurasidone, lumateperone, olanzapine/fluoxetine: Increased the risk of suicidal thoughts and behavior in short-term studies in children, adolescents, and young adults with major depressive disorder (MDD) and other psychiatric disorders.
- Brexpiprazole, caripirazine: Increased risk of suicidal thoughts and behaviors in pediatric and young adult patients.
- Clozapine: Severe neutropenia, seizures, orthostasis, bradycardia, syncope, myocarditis, cardiomyopathy, mitral valve incompetence.
- None related to youth: risperidone, asenapine, iloperidone, paliperidone, ziprasidone.

Warnings & Precautions – Second Generation (Atypical)

All second generation antipsychotics have the same warnings & precautions, some individual drugs just have added warnings

- Extrapyramidal side effects
- Neuroleptic Malignant Syndrome
- Tardive Dyskinesia
- Hyperglycemia and Diabetes Mellitus
- Hyperprolactinemia and gynecomastia (most common with risperidone and paliperidone)
- Weight gain (most weight gain with clozapine & olanzapine)
- Dyslipidemia
- Orthostatic hypotension
- Leukopenia, neutropenia, and agranulocytosis
- Lowers seizure threshold
- Cognitive and motor impairment potential
- Hyperthermia
- Dysphagia
- Rare cases of DRESS. The presence of a fever with a rash and swollen lymph glands or sweating to the face requires immediate medical attention.
- Possible increase in the risk of unexplained sudden death. However, this is still rare, and casualty has not been established.
- Iloperidone: increased drug-drug interaction potential
- Iloperidone: QTc prolongation which may be worse in CYP 2D6 slow metaboliers or in people taking CYP 2D6 inhibitors

- Paliperidone: Note: During adolescent clinical trials, higher doses [i.e., 6mg for subjects <51kg and 12mg for subjects ≥ 51kg] were not associated with greater efficacy, but increased risk of adverse effects.
- Cariprazine: Faster titration of cariprazine in youth led to increased incidence of parkinsonism and agitation in an open-label pediatric study. It is recommended to increase in weekly increments of no more than 1.5 mg. Of note, starting dose in the pediatric study ranged from 0.5 to 1.5mg/day. 1.5 mg capsules are the lowest commercially available strength at the time of this publication.
- Olanzapine/fluoxetine: Please also see SSRI warnings and precautions

Antipsychotics: First Generation (Typical)

Chlorpromazine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Thorazine® oral tablet (Brand name discontinued)** ▪ **Thorazine oral solution concentrate; (unflavored, sweetened), (Brand name discontinued)**	▪ Age > 6 months: 0.25 mg/lb. every 4 - 6 hours, as needed ▪ Adolescents: 10 - 25 mg/dose every 4 - 6 hours, as needed	▪ Age < 5 years: 40 mg/day ▪ Age 5-12 years: 75 mg/day ▪ Age > 12 years: 800 mg/day	▪ Approved for treatment of severe behavioral problems (age 1-12 years). ▪ Outpatient Children: 0.55 mg/kg every 4-6 hours, as needed. ▪ Approved for the management of manifestations of Psychotic Disorders (age > 12 years): 500 mg/day Note that chlorpromazine was approved by the FDA in an era when requirements were much less strict. It is doubtful that it would have been approved in the young age group with the same data today.	▪ One to three times daily ▪ Oral solution concentrate must be diluted prior to administration

Haloperidol

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Haldol® oral tablet (Brand name discontinued)** ▪ **Haldol® oral solution; (unflavored). (Brand name discontinued)**	▪ Age 3 - 12 years: ○ Weight 15 - 40kg: 0.025 - 0.05 mg/kg/day ○ Weight ≥ 40 kg: 1 mg/day ▪ Age > 12 years: 1 mg/day	▪ Age 3-12 years: 0.15 mg/kg/day or 6 mg/day, whichever is less ▪ Age >12 years: ○ Acute agitation: 10 mg/dose ○ Psychosis: 15 mg/day ○ Tourette's Disorder: 15 mg/ day	Approved for treatment of Psychotic Disorders, Tourette's Disorder, and severe behavioral problems (age ≥ 3 years). Little evidence that behavioral improvement is further enhanced with doses > 6 mg/day. ▪ Psychosis: 0.15 mg/kg/day ▪ Tourette's Disorder and severe behavioral problems: 0.075 mg/kg/day ▪ Severely disturbed children: 6 mg/day	One to two times daily

Perphenazine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Trilafon® oral tablet (Brand name discontinued)	▪ Age 6 - 12 years: Insufficient Evidence ▪ Age > 12 years: 4 mg once daily	▪ Age 6-12 years: Insufficient Evidence ▪ Age > 12 years: 64 mg/day	Approved for treatment of psychotic disorders (age ≥ 12 years): ▪ Outpatient: 24 mg/day ▪ Inpatient: 64 mg/day	One to three times daily

Pimozide

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Orap® oral tablet (Brand name discontinued)	Age ≥ 7 years: 0.05 mg/kg once a day At doses > 0.05 mg/kg/day CYP2D6 genotyping should be performed. In poor 2D6 metabolizers, dose should not exceed 0.05 mg/kg/day	▪ Age 7 - 12 years: 6 mg/day or 0.2 mg/kg/day, whichever is less ▪ Age ≥ 12 years: 10 mg/day or 0.2 mg/kg/day, whichever is less	Approved for treatment of Tourette's Disorder (age ≥ 12 years): 10 mg/day or 0.2 mg/kg/day, whichever is less	Once or twice daily

Patient Monitoring Parameters – First Generation (Typical)

- Fasting plasma glucose level or HbA1c – at baseline, at 12 weeks, then annually.
- Lipid screening – at baseline, at 12 – 16 weeks, and as clinically indicated
- Blood pressure, pulse – at baseline, at 12 weeks, and annually
- Weight (BMI) - at baseline, at 12 – 16 weeks, and annually. BMI should be compared against growth charts. Weight gain exceeding 90th percentile for age or a change of 5 BMI units for youth obese at treatment initiation should have weight management intervention and increased frequency of glucose and lipid monitoring.
- CBC as indicated.
- Pregnancy test, as clinically indicated.
- EPS evaluation (examination for rigidity, tremor, akathisia) - before initiation of any antipsychotic medication, then weekly for the first 2 weeks after initiating treatment with a new antipsychotic or until the dose has been stabilized and weekly for 2 weeks after a dose increase.
- Tardive Dyskinesia evaluation (AIMS or DISCUS) at regular intervals throughout treatment (at least every 6 months).
- Sexual function- inquire for evidence of galactorrhea/gynecomastia, menstrual disturbance, libido disturbance or erectile/ejaculatory disturbances in males (priapism has been reported with SGAs); this inquiry should be done at each visit for the first 12 months and at least annually thereafter.
- Vision questionnaire – ask whether the patient has experienced a change in vision and should specifically ask about distance vision and blurry vision- yearly.
- Cardiovascular – obtain family history at baseline. In patients with family history of cardiac abnormalities or sudden death, personal history of syncope, palpitations, or cardiovascular abnormalities, baseline EKG and subsequent monitoring is recommended. For patients with resting HR > 130 bpm, PR interval > 200 msec, QRS > 120 msec, or QTc > 460 msec, consider alternate therapy (AACAP Practice Parameter for the use of atypical antipsychotic medications in children and adolescents 2011).

- Pimozide: EKG required at baseline and as clinically indicated (use with other medications with QTc prolongation potential is contraindicated, e.g., escitalopram, citalopram, macrolides, etc.).

Boxed Warning – First Generation (Typical)

None related to youth

Warnings & Precautions – First Generation (Typical)

- Increased risk of extrapyramidal adverse effects compared to SGAs
- Tardive Dyskinesia
- Neuroleptic Malignant Syndrome
- Leukopenia, neutropenia, and agranulocytosis
- Drowsiness
- Orthostatic hypotension
- EKG changes
- EEG changes and seizures possible
- Ocular changes
- CNS depression
- Hyperprolactinemia
- Anticholinergic effects (constipation, dry mouth, blurred vision, urinary retention)
- Risk of prolonged QTc interval and torsade de pointes (particularly with pimozide)

Mood Stabilizers

Carbamazepine

Drug (brand)	Initial Dosage	Target Dosage Range	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Epitol® tablet** ▪ **Tegretol® tablet** ▪ **Tegretol® oral suspension; (citrus vanilla flavor)** ▪ **Tegretol® chewable tab, (cherry flavor; may vary among generic manufacturers.), (Brand no longer available)** ▪ **Tegretol® XR tablet** ▪ **Carbatrol® XR capsule** ▪ **Equetro® XR capsule**	▪ Age < 6 years: 10 - 20 mg/kg/day in 2 - 3 divided doses (4 divided doses for suspension) ▪ Age 6-12 years: 100 mg twice daily (50 mg four times daily for suspension) ▪ Age ≥ 13 years: 200 mg twice daily. (100 mg four times daily for suspension)	▪ Age 4 - 5 years: 35 mg/kg/day ▪ Ages 6 - 12 years: 400 - 800 mg/day ▪ Age ≥ 13 years: 800- 1200 mg/day Usual therapeutic trough level range is between 4 - 12 mcg/mL	▪ Age 4-5 years: 35 mg/kg/day ▪ Ages 6 - 12 years: 800 mg/day ▪ Age 13 - 15 years: 1000 mg/day ▪ Age > 15 years: 1200 mg/day	Only FDA approved for treatment of Seizure Disorders in children & adolescents. ▪ Age < 6 years: 35 mg/kg/day ▪ Age 6-15 years: 1000 mg/day ▪ Age > 15 years: 1200 mg/day The safety and effectiveness of EQUETRO® in pediatric and adolescent patients have not been established for indications other than Epilepsy	Two to four times daily Twice daily for XR formulations

Patient Monitoring Parameters – Carbamazepine

- CBC with differential at baseline and 1 to 2 weeks after each dose increase, annually, and as clinically indicated.

- Electrolytes - baseline and 1 to 2 weeks after each dose increase, annually, and as clinically indicated.
- Hepatic function at baseline, then monthly for first three months, and annually and as clinically indicated.
- Pregnancy test at baseline as appropriate, and as clinically indicated.
- Carbamazepine levels - obtain 1 week after initiation and 3 - 4 weeks after dose adjustment, then as clinically indicated.
- For patients with Asian descent, genetic test for HLA- B*1502 at baseline (prior to the initiation of carbamazepine). May use results of previously completed testing. Patients testing positive for the allele should not use carbamazepine unless benefit outweighs the risk.
- Monitor for the emergence of suicidal ideation or behavior.

Boxed Warning – Carbamazepine

- Serious dermatological reactions and HLA-B*1502 allele
- Aplastic anemia and agranulocytosis

Warnings & Precautions – Carbamazepine

- Stevens-Johnson Syndrome
- DRESS
- Aplastic anemia
- Suicidality
- Teratogenicity
- Neutropenia and agranulocytosis
- Hyponatremia
- Significant drug interaction potential; Induces its own metabolism as well as that of many other drugs (strong CYP 3A4 inducer)
- Decreased efficacy of oral contraceptives
- Withdrawal seizures
- Contraindicated to use within 14 days of an MAOI

Divalproex Sodium

Drug (brand)	Initial Dosage	Target Dosage Range	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Depakote® DR tablets** ▪ **Depakote® ER tablets** ▪ **Depakote® DR sprinkle capsules**	▪ < 25 kg: 125 mg QHS X 3 days, then increase to 125 mg BID ▪ 25-50 kg: 250 mg QHS X 3 days, then 125/250 mg/day ▪ > 50 kg: 250 mg QHS X 2 days, then 250 mg BID	Age ≥ 6 years: 30-60mg/kg/day Usual therapeutic trough levels for mood stabilization ▪ Acute mania: 85 - 125 mcg/mL ▪ Maintenance treatment: 50 - 125 mcg/mL	Age ≥ 6 years: Serum level: 125 mcg/mL, or 60 mg/kg/day	Only FDA approved for treatment of Seizure Disorders in children & adolescents. Age ≥ 10 years: Maximum dose based upon serum level: 50 - 100 mcg/mL, or 60 mg/kg/day	One to three times daily, depending on formulation.

Patient Monitoring Parameters - Divalproex

- CBC with differential and platelet count at baseline then 1 to 2 weeks after each dosage increase, every 3 months for the first year of treatment, then annually and as clinically indicated.
- Comprehensive metabolic panel (hepatic function, serum creatinine, BUN and electrolytes) at baseline, every 3 months for the first year of treatment, then annually and as clinically indicated.
- Pregnancy test at baseline as appropriate, and as clinically indicated.
- Weight at baseline, quarterly for the first year of treatment, then annually and as clinically indicated.
- Monitor for the emergence of suicidal ideation or behavior.
- Obtain trough valproic acid level 5 - 7 days after initiation and dosage change, then as clinically indicated.
- Steady state trough serum concentrations will be 10-15% lower with ER than with DR.
- For divalproex ER, blood for serum level should be drawn 18-24 hrs post dose.
- Saturation of serum protein binding may occur with higher serum levels, and the total serum level may no longer accurately reflect active drug.

Boxed Warning - Divalproex

- Hepatotoxicity (increased risk with very young children)
- Teratogenicity
- Pancreatitis

Warnings & Precautions - Divalproex

- Hepatotoxicity
- Pancreatitis
- Caution in patients with urea cycle disorders
- Teratogenicity
- Suicidal ideation
- Neutropenia and leukopenia (significantly increased risk with quetiapine co-administration)
- Thrombocytopenia
- Hyperammonemia
- Multi-organ hypersensitivity reaction
- Withdrawal seizures
- Polycystic ovarian syndrome
- Weight gain potential
- Alopecia
- DRESS

Lithium

Drug (brand)	Initial Dosage	Target Dosage Range	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Lithium carbonate capsules** ▪ **Eskalith® CR (XR tablet), 450 mg (Brand name unavailable)** ▪ **Lithobid® ER tablet, 300 mg** ▪ **Lithium citrate (oral solution) 8 mEq Li+/5mL; (No longer available)**	Age ≥ 6 years ▪ < 25 kg: 150 mg/HS ▪ 25-50 kg: 150 mg BID ▪ >50 kg: 150 mg BID	Dose adjustment based upon serum level; increase in weekly increments to achieve 12-hour post dose serum level: 0.6-1.2 mEq/L	Age ≥ 12 years: Serum level: 1.2 mEq/L, or 1800 mg/day, whichever is less	Approved for treatment of manic episodes and maintenance of Bipolar Disorder (age ≥ 7 years) ▪ Maximum dose: ○ 20-30 kg: ▪ Acute: 1500 mg ▪ Maintenance: 1200 mg ○ >30 kg: 1800 mg ▪ 12-hour post dose serum level: ○ Acute: 0.8 – 1.2 mEq/L ○ Maintenance: 0.6 – 1.2 mEq/L	Once or twice times daily

Patient Monitoring Parameters - Lithium

- EKG – baseline, yearly
- CBC – baseline, yearly
- Thyroid studies – baseline; then TSH every 6 months
- Comprehensive Metabolic Panel, baseline, 3 months, annually. Caution: BUN: serum creatinine ratio > 20 may be an indication of dehydration
- UA at baseline
- Pregnancy Test at baseline and as clinically indicated
- 12-hour post dose lithium levels obtain one week (i.e., 5 -7 days) after initiation or dosage change, 3 months after initiation; for maintenance treatment obtain serum level every 6 months
- Weight – baseline, every 6 months
- 12 hr post dose therapeutic serum level: 0.6 - 1.2 mEq/L (12 hrs post dose)
- Monitor for symptoms of excessive urination, thirst, etc.

Boxed Warning - Lithium

- Toxicity above therapeutic serum levels

Warnings & Precautions - Lithium

- Toxicity above therapeutic serum levels; narrow therapeutic index
- Chronic renal function impairment potential
- Hypothyroidism
- Teratogenicity
- EKG changes
- Avoid in patients with confirmed or suspected Brugada Syndrome (Risk of cardiac dysrhythmia and sudden death)
- Serotonin syndrome
- Increased risk of toxicity possible for patients with significant renal disease, dehydration, sodium depletion, concomitant drug interactions (ACEI, ARBS, NSAIDs, COXII inhibitors, diuretics, etc.)
- Polyuria

- Excessive thirst
- Tremor
- Diarrhea
- Nausea
- Vomiting
- Hand tremor

Lamotrigine

Drug (brand)	Initial Dosage	Target Dosage Range	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Lamictal® tablet** ▪ **Lamictal® CD tablets for oral suspension; black currant flavor** ▪ **Lamictal® ODT; cherry flavor** ▪ **Lamictal XR® tablet**	▪ **See Lamotrigine dosing tables below for initial dose** ▪ NOTE: Initial dose differs depending on age group and whether taking an enzyme inhibitor or inducer.	▪ **See Lamotrigine dosing tables below for dose titration** ▪ See FDA approved product label for detailed charts for alternate dosing in the presence of drug interactions; i.e., divalproex / valproic acid OR EIAEDs (carbamazepine, phenytoin, phenobarbital, primidone). Drugs@FDA: FDA-Approved Drugs ▪ If the patient has been off of lamotrigine > 5 days, it should be re-titrated beginning with the recommended initial dose	▪ **See Lamotrigine dosing tables below for dose titration and maximum doses** ▪ NOTE: Dosing differs depending on age group and whether taking an enzyme inhibitor or inducer. ▪ Recommended dosing for bipolar disorder in youth is from a randomized, placebo-controlled study conducted by Findling, et al. in youth with bipolar disorder in maintenance treatment.	▪ Only FDA approved for treatment of Seizure Disorders in children & adolescents. ▪ FDA label states that doses > 200 mg/day are not recommended for maintenance treatment of bipolar I disorder in adults. ▪ Maximum dose will vary depending on concurrent use of enzyme inhibitors or inducers. See the FDA approved product label. Drugs@FDA: FDA-Approved Drugs	Once or twice daily

Patient Monitoring Parameters- Lamotrigine

- Monitor for rash, especially during the first two months of therapy
- Renal function at baseline and as clinically indicated
- Hepatic function at baseline and as clinically indicated
- Pregnancy test at baseline as appropriate; and as clinically indicated
- CBC at baseline and as clinically indicated
- Monitor for the emergence of suicidal ideation or behavior
- Caregiver must be able to follow dosing instructions and monitor/supervise adherence to the lamotrigine regimen

Boxed Warning-Lamotrigine

- Cases of life-threatening serious rashes, including Stevens-Johnson syndrome and toxic epidermal necrolysis, and/or rash-related death. The rate of serious rash is greater in pediatric patients than in adults. Additional factors that may increase the risk of rash include:
  - coadministration with valproate;
  - exceeding recommended initial dose;
  - exceeding recommended dose titration.
- Benign rashes are also caused by lamotrigine; however, it is not possible to predict which rashes will prove to be serious or life threatening. Lamotrigine should be discontinued at the first sign of rash, unless the rash is clearly not drug related.

Warnings & Precautions-Lamotrigine

- Treatment of acute manic or mixed episodes with lamotrigine is not recommended (has primarily been studied for maintenance treatment)
- Dermatological reactions
- Potential Stevens- Johnson Syndrome; risk increased with too-rapid titration
- Drug reaction with eosinophilia and systemic symptoms (DRESS) reactions have occurred
- Suicidal ideation
- Aseptic meningitis
- Concomitant use with divalproex/VPA increases lamotrigine levels more than 2-fold (increased risk of rash/SJS without lamotrigine dose adjustment)
- Concomitant use with enzyme inducing AEDs (carbamazepine, phenytoin, phenobarbital, primidone) reduces serum lamotrigine levels approximately 40%
- Concomitant use with estrogen-containing oral contraceptives reduces lamotrigine levels up to 2-fold
- Withdrawal seizure potential
- Hemophagocytic lymphohistiocytosis possible. Evaluate immediately if symptoms occur; e.g., fever, rash, etc.

Oxcarbazepine

Drug (brand)	Initial Dosage	Target Dosage Range	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Trileptal® film-coated tablet** ▪ **Trileptal® oral suspension; plum-lemon flavor** ▪ **Oxtellar XR® tablet**	Age ≥ 7 years: 150 mg once or twice daily; not to exceed 8 - 10 mg/kg/day, divided BID	Titrate to efficacy/ tolerability: ▪ 20 - 29 kg: 900 mg/day ▪ 29.1 - 39 kg: 1200 mg/day ▪ > 39 kg: 1500 mg/day	▪ Age 7 - 12 years: 60 mg/kg/day or 1500 mg/day, whichever is less ▪ Age 13 - 17 years: 60 mg/kg/day or 2100 mg/day, whichever is less	▪ Only FDA approved for treatment of Seizure Disorders in children & adolescents. ▪ Maximum dose should not exceed 60 mg/kg/day (in seizure disorders); target to desired efficacy/ tolerability.	▪ Twice daily for film coated tablets and suspension. ▪ Once daily for extended-release tablets.

Patient Monitoring Parameters-Oxcarbazepine

- CBC with differential at baseline and 1 - 2 weeks after each dose increase, annually, and as clinically indicated
- Electrolytes – baseline and 1 - 2 weeks after each dose increase; monthly for the first 3 months, then annually, and as clinically indicated

- Obtain serum sodium if symptoms of hyponatremia occur (e.g., headaches, confusion, etc.).
- Hepatic function – baseline, annually, and as clinically indicated.
- Pregnancy test – baseline as appropriate, and as clinically indicated.
- For patients with Asian descent, genetic test for HLA-B*1502 at baseline (prior to the initiation of oxcarbazepine). May use results of previously completed testing.
- Monitor for the emergence of suicidal ideation of behavior.

Boxed Warning-Oxcarbazepine

None related to youth

Warnings & Precautions-Oxcarbazepine

- Hyponatremia -incidence may be as high as 24% in children
- Anaphylactic reactions and angioedema
- Patients with a past history of hypersensitivity to carbamazepine
- Serious dermatologic reactions
- Withdrawal seizure potential
- Cognitive/neuropsychiatric adverse events
- DRESS/Multi-organ hypersensitivity
- Hematologic events
- Dizziness
- Nausea
- Somnolence
- Diplopia
- Fatigue
- Decreased efficacy of oral contraceptives

Lamotrigine Dosing

Lamotrigine Dose Titration for Adolescents 10-12 years of age.

Study Week	For Patients Taking Valproate[a] (mg/kg/day)	For Patients not Taking Carbamazepine (or Other Enzyme-Inducing Drugs) and not Taking Valproate[b] (mg/kg/day)	For Patients Taking Carbamazepine (or Other Enzyme-Inducing Drugs) and not Taking Valproate[b] (mg/kg/day)
Weeks 1 and 2	0.15	0.3 [a]	0.6
Weeks 3 and 4	0.3	0.6	1.2
Week 5	0.6	1.2	2.4
Week 6	0.9	1.8	3.6

Study Week	For Patients Taking Valproate[a] (mg/kg/day)	For Patients not Taking Carbamazepine (or Other Enzyme-Inducing Drugs) and not Taking Valproate[b] (mg/kg/day)	For Patients Taking Carbamazepine (or Other Enzyme-Inducing Drugs) and not Taking Valproate[b] (mg/kg/day)
Week 7	1.2	2.4	4.8
Week 8	1.5	3.0	6.0
Week 9	1.8	3.6	7.2
Week 10	2.1	4.2	8.4
Week 11	2.4	4.8	9.6
Week 12	2.7	5.4	10.8
Week 13 - 18	3.0	6.0	12.0
Maximum Dose	3 mg/kg/day or 100 mg/day [a] whichever occurred first	6 mg/kg/day or 200 mg/day [b] whichever occurred first	12 mg/kg/day or 300 mg/day [b] whichever occurred first

[a] In 1 or 2 divided doses.[b] In 2 divided doses (unless noted otherwise)

Lamotrigine Dose Titration for Adolescents 13-17 years of age.

Study Week	For Patients Taking Valproate	For Patients not Taking Carbamazepine (or Other Enzyme-Inducing Drugs) and not Taking Valproate	For Patients Taking Carbamazepine (or Other Enzyme-Inducing Drugs) and not Taking Valproate
Weeks 1 and 2	25 mg every other day	25 mg/day	50 mg/day
Weeks 3 and 4	25 mg/day	50 mg/day	100 mg/day [a]
Week 5	50 mg/day (minimum dose)	100 mg/day (minimum dose)	150 mg/day [a]

Study Week	For Patients Taking Valproate	For Patients not Taking Carbamazepine (or Other Enzyme-Inducing Drugs) and not Taking Valproate	For Patients Taking Carbamazepine (or Other Enzyme-Inducing Drugs) and not Taking Valproate
Week 6	75 mg/day	150 mg/day	200 mg/day [a] (minimum dose)
Week 7	100 mg/day (target dose)	200 mg/day (target dose)	250 mg/day [a]
Week 8	125 mg/day	250 mg/day [a]	300 mg/day [a] (target dose)
Week 9	150 mg/day (maximum dose)	300 mg/day [a] (maximum dose)	350 mg/day [a]
Week 10 - 18	150 mg/day	300 mg/day [a]	400 mg/day [a] (maximum dose)

[a] In 2 divided doses.

Sedatives/Hypnotics

Melatonin

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
No brand name product available. Strongly recommended to only use products with the USP verified mark on the label. Controlled-release (CR) products may confer increased efficacy on sleep maintenance based on clinical trial data; however, USP designated CR products are uncommon in the U.S and not approved as a medication.	▪ Age ≥ 2-6 years: 1 - 2 mg ▪ Age 6-17 years: 1 - 2 mg	▪ Age 2-17 years: Range 2-10 mg daily ▪ Average optimal dose for 2-12 years = 5-6 mg daily ▪ Average optimal dose for ≥ 13 years = 8 mg daily ▪ Maximum daily dose for ages 2 - 17 years: 10 mg daily ▪ 2 mg may be an optimal dose for some patients without the need for dose escalation	Regulated by FDA as a dietary supplement and not as a medication (no FDA approved indications)	Administer 30-60 minutes before bedtime In patients with Delayed Sleep Phase Syndrome (DSPS) give 3 -6 hrs before bedtime

Patient Monitoring Parameters - Melatonin

Improvement of sleep (e.g., reduced sleep latency, improved quality of sleep, and morning alertness) may indicate efficacy.

Boxed Warning - Melatonin

None

Warnings & Precautions - Melatonin

- There are reports of wide dose variations in OTC melatonin products (i.e., the mg dose on the label may not match the actual mg dose in the product); and adulterated products containing no active ingredient or ingredients not declared on the label in non-USP verified melatonin products have been reported.)
- Melatonin poisonings are increasing – Administer no more than 10 mg once daily at bedtime in youth.
- Use a USP verified product to ensure safety/potency

Diphenhydramine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Benadryl® oral tablet/capsule/ syrup	▪ Age 3 - 5 years: 6.25 - 12.5 mg (1mg/kg max) ▪ Age 5 - 11 years: 12.5 - 25 mg ▪ Age ≥ 12 years: 25 - 50 mg	▪ 25 - 37 lbs: 12.5 mg ▪ 38 - 49 lbs: 19 mg ▪ 50 - 99 lbs: 25 mg ▪ ≥ 100 lbs: 50 mg Evidence suggests that tolerance develops to the hypnotic effects of diphenhydramine within 5 - 7 nights of continuous use	Approved for treatment of insomnia (age ≥ 12 years): 50 mg at bedtime	Once at bedtime

Patient Monitoring Parameters – Diphenhydramine

- Mental alertness
- Relief of symptoms
- If used as a hypnotic, monitor for improvement in sleep (falling asleep, staying asleep) and tolerance to the sedative effects
- Monitor for anticholinergic adverse effects (dry mouth, dry eyes, constipation, urinary retention/ hesitancy, etc.)

Boxed Warning - Diphenhydramine

None

Warnings & Precautions - Diphenhydramine

- Drowsiness
- Dizziness
- Dry mouth
- Nausea
- Nervousness
- Blurred vision
- Diminished mental alertness
- Paradoxical excitation
- Respiratory disease
- Hypersensitivity reactions
- May lower seizure threshold (avoid in epilepsy)

Hydroxyzine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Vistaril® (Hydroxyzine pamoate capsules)** ▪ **Atarax ® (Hydroxyzine HCl tablets, oral solution); mint flavor** ▪ **(Atarax brand name unavailable)**	Age ≥ 6 years: 0.5 mg/kg, up to 12.5 mg The oral solution and 10 mg tablets may be used for dosing flexibility for lower doses if needed.	▪ Age 6 - 11 years: 50mg/day in divided doses ▪ Age ≥ 12 years: 100mg/day in divided doses	Approved for treatment of anxiety and tension in age ≥ 6 years; Approved for pruritis in < 6 years ▪ Age < 6 years: 50 mg/day in divided doses ▪ Age ≥ 6 years: 50 - 100 mg/day in divided doses	▪ Anxiety: One to three times per day as needed (PRN) ▪ Insomnia: once at bedtime

Patient Monitoring Parameters – Hydroxyzine

- Mental alertness
- Relief of symptoms
- EKG in patients with history of arrhythmia or on concomitant medications affecting QTc interval
- Blood pressure
- If used as a hypnotic, monitor for improvement in sleep (falling asleep, staying asleep) and tolerance to the sedative effects
- Monitor for anticholinergic adverse effects (dry mouth, dry eyes, constipation, urinary retention/ hesitancy, etc.)

Boxed Warning - Hydroxyzine

None

Warnings & Precautions - Hydroxyzine

- Contraindicated in patients with prolonged QTc interval.
- Drowsiness
- CNS Depression
- Anticholinergic effects (dry mouth, dry eyes, constipation, urinary retention, or hesitancy possible)
- Involuntary motor activity
- Blurred vision
- Dizziness
- Diminished mental alertness
- Rare serious skin rash
- Paradoxical excitation

Trazodone

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Desyrel® oral tablet (Brand name unavailable)	▪ Children: Insufficient Evidence ▪ Adolescents: 25 mg	▪ Children: Insufficient Evidence ▪ Adolescents: 150 mg/day	Not FDA approved in children and adolescents Not approved for use as a hypnotic	Once at bedtime

Patient Monitoring Parameters – Trazodone

- Improvement of sleep (e.g., reduced sleep latency, improved quality of sleep, and morning alertness) may indicate efficacy
- Baseline liver function tests and periodically throughout treatment

Boxed Warning - Trazodone

Increased risk compared to placebo of suicidal thinking and behavior (suicidality) in children, adolescents, and young adults in short-term studies of major depressive disorder (MDD) and other psychiatric disorders.

Warnings & Precautions - Trazodone

- Next morning hangover symptoms
- Serotonin Syndrome
- Use Contraindicated within 14 days of an MAOI
- Suicidal ideation
- Activation of mania/hypomania
- Discontinuation syndrome – In the absence of serious adverse reactions, taper when discontinuing
- Abnormal bleeding
- QT prolongation and risk of sudden cardiac death
- Orthostatic hypotension and syncope
- Priapism
- Hyponatremia
- Cognitive and motor impairment.
- Doses ≥ 300 mg/day are associated with serotonergic (i.e., antidepressant) effects, and are not recommended in youth

Ramelteon

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Rozerem® oral tablet	Reviewed but not included/recommended - insufficient evidence in pediatric patients; very few case reports and case series exist in this population. Not FDA Approved in children and adolescents.			Once daily 30-60 minutes before bedtime; should not be administered with or directly after a high-fat meal.

Patient Monitoring Parameters – Ramelteon

- Improvement of sleep (e.g., reduced sleep latency, improved quality of sleep, and morning alertness) may indicate efficacy.
- Ask about adverse effects including behavior changes and abnormal thinking at each appointment.

Boxed Warning - Ramelteon

None

Warnings & Precautions - Ramelteon

- Hypersensitivity reactions
- Need to evaluate for comorbid diagnoses

- Abnormal thinking and behavioral changes
- CNS depression
- Decreased testosterone possible
- Hyperprolactinemia possible

Tasimelteon

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Hetlioz® oral capsule** ▪ **Hetlioz LQ® oral suspension; cherry flavor**	Reviewed but not included/recommended - insufficient evidence for routine insomnia. FDA approved for nighttime sleep disturbances in Smith-Magenis Syndrome (SMS) in adults and children as young as three [FDA approval based on a very small study (N = 26, age 3 - 39 years with SMS)]			

Patient Monitoring Parameters – Tasimelteon

- Baseline liver function tests and periodically throughout treatment.
- Refer to prescribing information.

Boxed Warning - Tasimelteon

None

Warnings & Precautions - Tasimelteon

- Headache
- Increased serum alanine aminotransferase
- Abnormal dreams
- Nightmares

Zolpidem

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Ambien® oral tablet** ▪ **Ambien CR® tablet**	Reviewed but not included/recommended based on results from a large (failed) controlled trial in youth with ADHD and insomnia (N = 201) – failed to separate from placebo in latency to persistent sleep; increased rate of adverse events in pediatric patients. Not FDA approved in children and adolescents.			

Eszopiclone

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Lunesta® oral tablet	Reviewed but not included/recommended based on results from a very large (failed) controlled trial. (N = 486) in youth with ADHD and insomnia – failed to separate from placebo in latency to persistent sleep; increased rate of adverse events in pediatric patients. Not FDA approved in children and adolescents.			

Patient Monitoring Parameters – Zolpidem, Eszopiclone

- Improvement of sleep (e.g., reduced sleep latency, improved quality of sleep, and morning alertness) may indicate efficacy.
- Ask about adverse effects including behavior changes and abnormal thinking at each appointment.

Boxed Warning - Zolpidem, Eszopiclone

- Zolpidem only: Complex sleep behaviors, including sleepwalking, sleep-driving, and engaging in other activities while not fully awake may occur following use of zolpidem. Some of these events may result in serious injuries, including death. Discontinue zolpidem immediately if a patient experiences a complex sleep behavior.
- Eszopiclone: None

Warnings & Precautions - Zolpidem, Eszopiclone

- Hallucinations in children 6 - 17 have been reported
- Complex sleep behaviors possible
- Abnormal thinking and behavior changes
- Withdrawal effects and rebound insomnia possible with use > 2 weeks
- Drug abuse and dependence
- Tolerance

Suvorexant

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Belsomra® oral tablet	Reviewed but not included/recommended - insufficient evidence Not FDA approved in children and adolescents.			

Patient Monitoring Parameters – Suvorexant

- Improvement of sleep (e.g., reduced sleep latency, improved quality of sleep, and morning alertness) may indicate efficacy.
- Ask about adverse effects including behavior changes and abnormal thinking at each appointment.

Boxed Warning - Suvorexant

None

Warnings & Precautions- Suvorexant

- Sleep paralysis
- Somnolence
- Headache
- Abnormal dreams
- Complex sleep behaviors
- Antagonism of orexin receptors may also underlie potential adverse effects such as signs of narcolepsy/cataplexy

Benzodiazepines

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
▪ **Alprazolam/ Xanax®** ▪ **Clonazepam/ Klonopin®** ▪ **Diazepam/ Valium®** ▪ **Lorazepam/ Ativan®** ▪ **Oxazepam/ Serax® (Brand name unavailable)** ▪ **Temazepam/ Restoril®**	Reviewed but not included/recommended – evidence of possible harm; increased incidence of adverse effects and potential for abuse and/or addiction			

Patient Monitoring Parameters – Benzodiazepines

Refer to individual prescribing information for each product

Boxed Warning - Benzodiazepines

- Concomitant use of benzodiazepines and opioids may result in profound sedation, respiratory depression, coma, and death.
- Risk of abuse, misuse, and addiction.
- Abrupt discontinuation use may precipitate acute withdrawal reactions.

Warnings & Precautions - Benzodiazepines

- Withdrawal effects
- Drug abuse and dependence
- Tolerance
- Next morning sedation
- Paradoxical agitation and disinhibition

Miscellaneous

Deutetrabenazine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Austedo ®	Reviewed but not included/recommended - insufficient evidence.		Not approved for children and adolescents.	Once or twice daily

Boxed Warning - Deutetrabenazine

- Suicidality in patients with Huntington's Disease.

Warnings & Precautions – Deutetrabenazine

- Suicidality
- Clinical Worsening and Adverse events in Huntington's Disease
- QT prolongation (not clinically significant when dosed appropriately)
- Neuroleptic Malignant Syndrome
- Akathisia, Agitation, and restlessness
- Parkinsonism
- Sedation and somnolence

- May cause hyperprolactinemia – appropriate lab testing should be done if there is a clinical suspicion

Dexmedetomidine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
IGALMI® Sublingual or buccal film	Reviewed but not included/recommended - insufficient evidence.		Not approved for children and adolescents.	Maximum of doses, each at least 2 hours apart. should be administered under the supervision of a healthcare provider

Boxed Warning – Dexmedetomidine

None

Warnings & Precautions - Dexmedetomidine

- A healthcare provider should monitor vital signs and alertness after administration to prevent falls and syncope.
- Hypotension, orthostatic hypotension, bradycardia
- QTc prolongation
- Somnolence
- The safety and effectiveness have not been established beyond 24 hours from the first dose.

Valbenazine

Drug (brand)	Initial Dosage	Literature Based Maximum Dosage	FDA Approved Maximum Dosage for Children & Adolescents	Schedule
Ingrezza®	Reviewed but not included/recommended. Studied in children and adolescents for tics associated with Tourette's disorder (failed trial); no published clinical trials for tardive dyskinesia in pediatrics.		Not approved for children and adolescents.	Once daily

Boxed Warning – Valbenazine

None

Warnings & Precautions - Valbenazine

- Somnolence
- QT prolongation possible, especially in the presence of drug-drug interactions
- Avoid use in patients with long QT syndrome or cardiac arrhythmias associated with prolonged QT interval
- Drug-drug interaction potential
- Parkinsonism

Titration of Antipsychotic Medications

Medication	Indication	Initial Dose	Titration Increments	Target Dose	Effective Daily Dose Range
Risperidone	Schizophrenia adolescents	0.5 mg/day	0.5-1 mg; no more often than daily*	3 mg	1-6 mg

Medication	Indication	Initial Dose	Titration Increments	Target Dose	Effective Daily Dose Range
Usual dosing is once daily, but can change to twice daily for persistent somnolence	Bipolar mania children and adolescents	0.5 mg/day	0.5-1 mg; no more often than daily*	1-2.5 mg	1-6 mg
	Irritability in autistic disorder body weight < 20 kg	0.25 mg/day	Can ↑ to 0.5mg on Day 4; then ↑ by 0.25 mg every 2+ weeks	0.5 mg	0.5-3 mg
	Irritability in autistic disorder body weight ≥ 20 kg	0.5 mg/day	Can ↑ to 1mg on Day 4; then ↑ by 0.5 mg every 2+ weeks	1 mg	0.5-3 mg
Aripiprazole Once daily dosing is recommended	Schizophrenia adolescents	2 mg/day	2 mg x2 days; then 5 mg x2 days; then 10 mg target; can ↑ in 5mg increments thereafter every 2+ weeks	10 mg	30 mg
	Bipolar mania children and adolescents	2 mg/day	2 mg x2 days; then 5 mg x2 days; then 10 mg target; can ↑ in 5 mg increments thereafter every 2+ weeks	10 mg	30 mg
	Irritability in autistic disorder body weight < 20 kg	2 mg/day	2 mg x2 days; then 5 mg; can ↑ in 5 mg increments gradually at intervals of no less than 1 week	5-10 mg	15 mg
	Tourette's body weight < 50 kg	2 mg/day	2 mg x2 days; then 5mg; can ↑ in 5mg increments gradually at intervals of no less than 1 week	5 mg	10 mg
	Tourette's body weight ≥ 50 kg	2 mg/day	2 mg x 2 days; then 5 mg x 5 days, with a target dose of 10 mg/d on Day 8; can ↑ in 5mg increments gradually at intervals of no less than 1 week	10 mg	20 mg
Quetiapine Usual dosing is twice daily, but can change to three times daily dosing for tolerability (sedation/somnolence)	Schizophrenia adolescents	25 mg twice daily	Day 1: 50 mg total dose, divided twice daily Day 2: 100 mg total dose, divided twice daily Day 3: 200 mg total dose, divided twice daily Thereafter, can gradually ↑ in increments of no more than 100mg/day; not to exceed the max recommended daily dose	400-800 mg/day	800 mg
	Bipolar mania children and adolescents	25 mg twice daily	Same titration as above	400-600 mg/day	600 mg
Olanzapine Once daily dosing in the evening is recommended	Schizophrenia adolescents	2.5 - 5 mg/day	Titration increments of 2.5 - 5 mg are recommended	12.5 mg	10-20 mg
	Bipolar mania children and adolescents	2.5 - 5 mg/day	Titration increments of 2.5 - 5 mg are recommended	10 mg	10-20 mg
Asenapine Twice daily dosing is recommended Sublingual (SL) administration only; fully dissolve tablet under tongue, then wait 10 minutes to eat or drink	Bipolar mania in 10-17 year-olds	2.5 mg SL twice daily	2.5 mg SL twice daily x 3 days, then 5 mg SL twice daily x 3 days. Thereafter can ↑ to 10 mg SL twice daily if desired after no more than 3 days Note: Faster titration may increase risk of dystonia	2.5-10 mg SL twice daily (5 mg - 20 mg total daily dose)	10 mg SL twice daily

Medication	Indication	Initial Dose	Titration Increments	Target Dose	Effective Daily Dose Range
Paliperidone Once daily dosing is recommended	Schizophrenia adolescents body weight < 51 kg	3 mg/day	Initial dose titration is not required. Dose adjustments can be made in increments of 3 mg, at intervals of 5+ days.	3-6 mg	6 mg
	Schizophrenia adolescents body weight ≥ 51 kg	3 mg/day	Initial dose titration is not required. Dose adjustments can be made in increments of 3 mg, at intervals of 5+ days.	3-12 mg	12 mg
Lurasidone Once daily dosing is recommended. Take with food ~ at least 350 calories	Schizophrenia adolescents	40 mg/day	Initial dose titration is not required	40-80 mg	80 mg
	Depressive episode in Bipolar I disorder in children and adolescents	20 mg/day	Initial dose titration is not required. The dose may be ↑ after 1 week based on response & tolerability.	20-40mg	80 mg
Brexpiprazole Once daily dosing is recommended	Schizophrenia adolescents	0.5 mg/day	Day 1: 0.5 mg once daily Day 5: 1 mg once daily Day 8: May ↑ to 2mg once daily based on clinical response and tolerability May increase weekly thereafter, in 1mg increments	2-4 mg	4 mg
Olanzapine (O) /fluoxetine (F) combination Once daily dosing in the evening is recommended	Depressive episode in Bipolar I disorder in children and adolescents	2.5 mg (O) +20 mg (F) once a day	Titration increments of 2.5 - 5 mg (O) are recommended; Titration increments of 10 - 20 mg (F) are recommended	2.5-10 (O)/ 20-50 (F)	12mg (O) 50mg (F)

Recommended titration for antipsychotic medications with FDA-approved indications in children and adolescents (based on individual product labeling/package inserts).

Abbreviations/symbols: ↑ = increase(d); QD = once daily dosing; BID = twice daily dosing (usually morning and evening, 10-12 hours apart); TID = three times daily dosing (usually 6-8 hours apart); kg = kilograms (1 kg is equivalent to 2.2 pounds); SL = sublingual; O = olanzapine/F = fluoxetine

***Slower titration may be advisable for some patients, particularly those with developmental disorders, a history of adverse events, or EPS with antipsychotic medication**

NOTE: Many of the psychotropic medications are metabolized in the liver through the CYP 450 enzymes, and some of them are either inhibitors or inducers of P450 enzymes. Such medications may have a potential for drug interactions. It is beyond the scope of these parameters to list each potential drug interaction. The clinician is encouraged to consult a reliable reference on drug interactions. One website that is available is the Flockhart Table™ maintained by the Clinical Pharmacology Division at Indiana University School of Medicine. The table lists medications metabolized by specific CYP 450 substrate enzyme, and inhibitors and inducers of those substrate enzymes. Please note that if you click on a medication it will bring up a reference documenting that the drug is metabolized through that pathway and as well as a reference for each inhibitor drug or inducer drug. The authors also color code for how potent the specific enzyme inhibitor or inducer is. The table is available at

Indiana Universty School of Medicine's Cytochrome P450 Drug Interaction Table

The most recent version of the FDA approved labelling for most prescription medications can be found at [Drugs@FDA: FDA Approved Drugs.]

Glossary

Acronym/ Abbreviation	Definition
AACAP	American Academy of Child and Adolescent Psychiatry
ACEI	Ace inhibitor. Antihypertensive medication.
AIMS	Abnormal involuntary movement scale
ANC	Absolute neutrophil count
ARB	Angiotensin receptor blocker. Antihypertensive medication.
BID	Twice daily dosing (usually morning and evening, 10-12 hours apart)
BMI	Body mass index. A measure of body fat based upon height and weight
BP	Blood pressure
BUN	Blood urea nitrogen
CBC	Complete blood count. Lab test used to monitor for abnormalities in blood cells, e.g., for anemia
CD	Controlled delivery
COX II inhibitors	Cyclooxygenase II inhibitor pain medication
Cp	Plasma concentration
CR	Controlled-release
CYP	Cytochrome P450
EEG	Electroencephalogram
EIAED	Enzyme Inducing Anti-Epileptic Drugs (e.g. carbamazepine, phenobarbital, phenytoin, primidone)
EKG	Electrocardiogram
EPS	Extrapyramidal side effects. These are adverse effects upon movement, including stiffness, tremor, and severe muscle spasm
ER	Extended-release
FDA	U.S. Food and Drug Administration
GAD	Generalized anxiety disorder
HbA1c	Hemoglobin A1c is a laboratory measurement of the amount of glucose in the hemoglobin of the red blood cells. Provides a measure of average glucose over the previous 3 months
HR	Heart rate
IR	Immediate-release
Kg	Kilograms (1 kg is equivalent to 2.2 pounds)
LA	Long-acting
LFTs	Liver function tests
MAOI	Monoamine oxidase inhibitor
MDD	Major depressive disorder

Acronym/ Abbreviation	Definition
MRI	Magnetic resonance imaging
Msec	Millisecond
NRS	Neurological rating scale
NSAID	Non-steroidal anti-inflammatory drug
OCD	Obsessvie-compulsive disorder
ODT	Orally disintegrating tablet
PRN	As needed
Prolactin	A hormone produced by the pituitary gland
QD	Once daily dosing
Serum creatinine	A lab test used to calculate an estimate of kidney function
SL	Sublingual
SR	Sustained-release
SSRI	Selective serotonin reuptake inhibitor
TCA	Tricyclic antidepressant
TD	Transdermal
TFT	Thyroid function test
TID	Three times daily dosing (usually 6-8 hours apart)
UA	Urine analysis
XL	Extended-length
XR	Extended-release

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