MC3

Pediatric Psychopharmacology Reference Cards







MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN

DEPARTMENT OF PSYCHIATRY

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Antidepressants (1)¥

Generic (Trade)	S: start dose(mg) T: target dose (mg/day)	Titration Schedule	Formulations (mg)	t 1/2 (hr)	FDA Approved in Youth[1]	N: notes; S: side effects; R: risks All: Black Box Warning for SI
Fluoxetine (Prozac)	S: 5-10 T: 20-60§	5-10 mg q 2 weeks	**tab**: 10, 20, 60 **cap**: 10, 20, 40 **weekly cap**: 90 **liq**: 4mg/mL	96-384	≥7y OCD ≥8y MDD ≥10y Bipolar depression, in combo w/ olanzapine (Puvule capsule only)	N: Long titration / washout = self-tapering N: CYP 2D6 inhibition S: Behaviorally activating
Sertraline (Zoloft)	S: 12.5-25 T: 50-200§	25 mg q 2 weeks	**tab**: 25, 50, 100 **liq**: 20mg/mL	26	≥6y OCD	
Escitalopram (Lexapro)	S: 2.5-5 T: 10-30	5-10 mg q 2 weeks	**tab**: 5, 10, 20 **liq**: 1mg/mL	27-32	≥12y MDD	N: Few CYP interactions
Fluvoxamine (Luvox)	S: 12.5-25 T: 50-200§	25 mg q 2 weeks	**tab**: 25, 50, 100	16	≥8y OCD (immediate release only)	N: CYP 2C9 inhibition
Citalopram (Celexa)	S: 5-10 T: 20-40	10 mg q 2 weeks	**tab**: 10, 20, 40 **liq**: 2mg/mL	35	--	N: Few CYP interactions R/S: ↑QTc risk >40mg
Bupropion (Wellbutrin)	S: 37.5-75 T: 150-300	37.5 – 75 mg q 2 weeks	**tab**: 75, 100 **er**: 100, 150, 174, 200, 300, 348, 450, 522	21-37	--	N: Behaviorally activating; used to augment SSRI, treat ADHD R/S: ↑Anxiety, ↑SZ risk
Trazodone (Desyrel)	S: 25 T: 50-100	25 mg weekly	**tab**: 50, 100, 150, 300 **er**: 150, 300	10	--	N: Use for insomnia R/S: Priapism
Mirtazapine (Remeron)	S: 7.5-15 T: 15-30	7.5 mg q 2 weeks	**tab**: 7.5, 15, 30, 45 **dis**: 15, 30, 45	20-40	--	N: Used to augment SSRI, treat insomnia S: Stimulates appetite R: ↑Appetite / wgt gain
Duloxetine (Cymbalta)	S: 20 T: 30-60	20 mg q 2 weeks	**dr**: 20, 30, 40, 60	12	≥7y GAD	N: Limited evidence supporting use for depression in children

¥Some also used for anxiety and chronic pain, §Higher doses needed for OCD. CYP = Cytochrome P450 proteins;
tab = tablet; **cap** = capsule; **liq** = oral liquid, **er** = extended release, **dr** = delayed release.
[1]Only psychotropic use approvals are listed. Medications may have other approvals in youth.

Antidepressants (2)¥

Generic (Trade)	S: start dose (mg) T: target dose (mg/day)	Titration Schedule	Formulations (mg)	t 1/2 (hr)	FDA Approved in Youth[1]	N: notes; S: side effects; R: risks All: Black Box Warning for SI
Paroxetine ** (Paxil)	S: 5-10 T: 10-40	5-10 mg q 2 weeks	**tab**: 10, 20, 30, 40 **er**: 12.5, 25, 37.5 **liq**: 2mg/mL	21	--	N: ↓Lit. support in minors; anxiolytic, CYP interaction R: ↑SI risk among SSRIs
Venlafaxine ** (Effexor)	S: 25-37.5 T: 150-300	25 mg q 2 weeks	**tab**: 25, 37.5, 50, 75, 100 **er cap**: 37.5, 75, 150 **er tab**: 37.5, 75, 150, 225	5-11	--	N: ↓Lit. support in minors S/R: Hypertension risk Marked withdrawal (vertigo, n/v, paresthesia, headache) on abrupt discontinuation
Desvenlafaxine * (Pristiq)	S: 50 T: 100	25 mg q 2 weeks	**er tab:** 25, 50, 100	11	--	N: ↓Lit. support in minors S: Hypertension risk
Buspirone (Buspar)	S: 2.5-5 BID T: 5-15 TID	5 mg q 2-3 days	**tab**: 5, 7.5, 10, 15, 30	2-4	--	N: 3-6 weeks for effect Substrate of CYP3A4
Vilazodone * (Viibryd)	S: 10 T: 40	10 mg q 2 weeks	**tab**: 10, 20, 40, 10-20	25	--	N:↓ Lit. support in minors SSRI + partial 5HT1a agonist; substrate of CYP3A4
Gabapentin (Neurontin)	S: 100 BID T: 300-600 BID	100 – 300 mg q 3-4 days	**cap**: 100, 300, 400 **tab**: 600, 800; **er**: 300, 600 **liq**: 250mg/5mL	5-7	--	N: Used for anxiety and chronic pain. R: Decrease dosing in renal impairment Start: 10-15mg/kg/d divided TID Max: 40mg/kg/d up to 2400mg TDD
Vortioxetine * (Trintellix)	S: 5-10 T: 20	5 mg q 2 weeks	**tab**: 5, 10, 20	66	--	N: ↓Lit. support in minors

¥Some also used for anxiety and chronic pain. *Limited data for use in children. **Typically not recommended in minors.
CYP = Cytochrome P450 proteins; **tab** = tablet; **cap** = capsule; **liq** = oral liquid, **er** = extended release, **dr** = delayed release.
[1]Only psychotropic use approvals are listed. Medications may have other approvals in youth.

Antipsychotics/Neuroleptics

Generic (Trade) RDE	S: start dose (mg) T: target dose (mg/day)	Titration Schedule	Formulations (mg)	Peak (hr)	t 1/2 (hr)	FDA Approv in Youth[1]	N: notes; S: side effects; R: risks
Risperidone (Risperdal) 2	S: 0.25-1 T: 0.5-4	0.25 – 0.5 mg weekly	**ir**: 0.25, 0.5, 1, 2, 3, 4, **liq**: 1 mg/ml **sl**: 0.5, 1, 2, 3, 4 **dp**: 12.5, 25, 37.5, 50 mg	1-2	20-30	≥13y schizophrenia ≥10y mania/mixed ≥5y irritable (ASD; oral only)	R: ↑Prolactin, metabolic
Aripiprazole (Abilify) 7.5	S: 2-5 T: 2-30	2-5 mg q 2 weeks	**ir**: 2, 5, 10, 15, 20, 30, **liq**: 1 mg/ml **sl**: 10, 15 **im**: 7.5mg/ml	3-5	50-72	≥6y agitation (ASD) ≥10y bipolar mania ≥13y schizophrenia ≥6y Tourette's	R: Akathisia
Ziprasidone (Geodon) 60	S: 20 qd T: 20-60 bid	20 mg q 3-4 days	**ir**: 20, 40, 60, 80 **im**: 20mg/ml	5	5-7	--	N: Take with food R: ↑QTc, akathisia
Quetiapine (Seroquel) 75	S: 12.5-50 T: 50-750	12.5 – 25 mg q 3-4 days	**ir**: 25, 50, 100, 200, 300, 400 **xr**: 50, 150, 200, 300, 400	2	6-7	≥13y schizophrenia (ir formulation) ≥10y bipolar	S: Sedation
Olanzapine (Zyprexa, Zydis) 5	S: 2.5-5 T: 2.5-20	2.5 mg q 2 weeks	**ir**: 2.5, 5, 7.5, 10, 15, 20 **sl**: 5, 10, 15, 20 (Zydis) **im**: 10mg vial **dp**: 210, 300, 405 mg	6	21-54	≥13y schizophrenia ≥10y mania/mixed ≥10y adjunct for bipolar depression	S: Most weight gain, sedation R: Hypotension (w/ EtOH / BZDs)
Paliperidone (Invega) 3	S: 3 T: 3-12	1.5 mg q 2 weeks	**ir**: 1.5, 3, 6, 9 **dp**: 39, 78, 156, 234 mg	24	21-30	≥12y schizophrenia	R: ↑Prolactin
Lurasidone (Latuda) 40	S: 20 T: 20-80	20 mg weekly	**ir**: 20, 40, 60, 80, 120	1-3	18	≥13y schizophrenia ≥10y bipolar depression	N: Take with food R: Akathisia
Haloperidol (Haldol) 2	S: 0.25-1 T: 1-6	0.25 – 0.5 mg weekly	**ir**: 0.5, 1, 2, 5, 10, 20, **liq**: 2 mg/ml **im**: 5mg/ml **dp**: 50, 100mg/ml	2-6	12-22	≥3y schizophrenia ≥3y disruptive d/o ≥3y Tourette's ≥3y hyperactive behavior	R: ↑EPS/NMS
Pimozide (Orap) 1.5		1 mg q 2 weeks	**ir**: 1, 2	7	55	≥12y Tourette's	R: ↑EPS/NMS, ↑QTc

ir = immediate release; **xr** = extended release; **sl** = sublingual, **liq** = oral liquid, **im** = intramuscular, **dp** = depot; **RDE**= Relative Dose Equivalence (mg); **EPS** = Extrapyramidal Symptoms; **NMS** = Neuroleptic Malignant Syndrome; **ASD** = Autism Spectrum Disorder;
Metabolic risk with all antipsychotics = ↑Wgt, ↑lipids, ↑HgA1c, ↑fasting glucose
[1]Only psychotropic use approvals are listed. Medications may have other approvals in youth.

Antipsychotics/Neuroleptics (cont.)

Generic (Trade)	S: start dose (mg) T: target dose (mg/day)	Titration Schedule	Formulations (mg)	Peak (hr)	t 1/2 (hr)	FDA Approv in Youth[1]	N: notes; S: side effects; R: risks
Brexpiprazole (Rexulti)	S: 1 T: 2-4	0.25 – 0.5 mg q 2 weeks	0.25, 0.5, 1, 2, 3, 4	4	91	--	R: SI, TD, leukopenia, akathisia
Asenapine (Saphris)	S: 2.5-5 T: 10-20	2.5 mg weekly	sl: 2.5, 5, 10	0.5-1.5	24	≥10y bipolar 1	R: Akathisia, TD
(O)Olanzepine-(F)Fluoxetine (Symbyax)	S: (O) 3 (F) 25 T: (O) 6 (F) 25	q 2 weeks	(O:F), 3:25, 6:25, 6:50, 12:25, 12:50	4 h (O) 6 h (F)	192	≥10y bipolar depression	N: Not evaluated in doses >12 mg (O) /50 mg (F) in children

[1]Only psychotropic use approvals are listed. Medications may have other approvals in youth.

Starting and Monitoring Antipsychotics in Children [1]

	Baseline	qVisit	qTitration	@3 Mo.	q6 Mo.	qYear
Patient & Family History[2]	X					X
Lifestyle/Behaviors[3]	X	X				
Weight	X	X				
BP/Pulse	X					
HgA1c/Glc	X			X	X	
Lipids	X			X	X	

[1] Based on Correll, Int Rev Psychiatry 2008; 20(2):195-201. Other labs that are not routinely checked but may warrant monitoring include prolactin, CBC and/or LFTs.

[2] Obesity, hypertension, diabetes, dyslipidemia, hx of coronary heart disease (CHD) or equivalent (diabetes, peripheral arterial disease, abdominal aortic aneurysm, symptomatic carotid artery disease, arrhythmias, QT prolongation), hx of premature CHD in 1° relatives (males < 55y and females < 65y), hx of adverse/allergic reaction.

[3] Diet, exercise, smoking, substance use, sleep hygiene

Lithium and Antiepileptic Drug (AED) Mood Stabilizers

Generic (Trade)	LS	Start (daily total mg)	Target Dose (Blood Level)	Titration Schedule	Formulations (mg)	t 1/2 (hr)	FDA Approved in Youth[1]	Notes / Boxed Warnings
Lithium (Lithobid, Eskalith)	A	<25kg: 300 25-40kg: 600 >40kg: 900	600-1500 mg 25-30mg/kg/d (0.6-1.2 mEq/L)	300 mg q 3-5d	**ir**: 150, 300, 600 **dr**: 300, 450 **liq**: 8mEq/5mL	12-27	≥7y mania/mixed ≥7y bipolar 1 maintenance	↓Therapeutic window ↓Thyroid; NSAIDs toxic Brugada syndrome
Valproic Acid (Depakene, Depakote)	B	<25kg: 250 25-40kg: 375 >40kg: 500	500-2000 mg 30mg/kg/d (50-120 mg/L)	10 mg/kg/d q 3-4d	**s**: 125 **dr**: 125, 250, 500 **liq**: 50mg/mL	4-14 child 9-18 adult	--	Hepatic necrosis (<2yo) Hepatitis, Pancreatitis, PCOS Teratogenic
Carbamazepine (Tegretol, Carbatrol)	B	<25kg: 100 25-40kg: 200 >40kg: 400	400-1200 mg (8-12 mg/L)	100 mg q 5d	**ir**: 200 **c**: 100 **dr**: 100, 200, 300, 400 **liq**: 20mg/mL	18-55 initial 12-17 stable	--	SJS/TEN (↑in Asians) Agranulocytosis Glaucoma
Lamotrigine (Lamictal)	C	<40kg: 12.5 >40kg: 25	75 - 400 mg (4.5-7.5 mg/kg/d)	12.5-25 mg q 7d	**ir**: 25, 100, 150, 200 **c**: 5, 25 **dr**: 25, 50, 100, 200, 250, 300	13	--	SJS/TEN (↑in kids)
Topiramate (Topamax)	C	<40kg: 15 >40kg: 25	50 - 400 mg SZ: 5-9mg/kg/d	25 mg q 3-7d	**ir**: 25, 50, 100, 200 **s**: 15, 25 **dr**: 25, 50, 100, 150, 200	21	--	↑[NH_4], Glaucoma Metabolic acidosis Renal stones, sedation
Oxcarbazepine (Trileptal)	D	8-10/kg/d	600-2100 mg	5 mg/kg/d q 3d	**ir**: 150, 300, 600 **dr**: 150, 300, 600 **liq**: 60mg/mL	parent: 2 10-OH: 9	--	SJS/TEN (↑in Asians) Sedation
Screen & Monitor for All: pregnancy, CBC, Chem7, thyroid function, kidney (lithium) or liver (AEDs) dysfunction.								

LS = literature support: **A** = effective in placebo-controlled randomized trials (PC-RT) in children, **B** = effective in PC-RT in adults, **C** = positive results in child/adol open trial(s), **D** = positive in child/adol case report(s); SZ = seizures; **ir** = immediate release; **dr** = delayed release (XR, ER); **c** = chewable; **s** = sprinkles; **liq** = oral liquid. SJS/TEN = Stevens-Johnson Syndrome/Toxic Epidermal Necrolysis

[1]Only psychotropic use approvals are listed. Medications may have other approvals in youth.

Stimulants

Type	Trade	Formulations (mg)	*t* ½	FDA Appr[1]	FDA Max (mg/d)	Starting Dose
MPH	Ritalin Methylin *c* Methylin Soln.	5, 10, 20 2.5, 5, 10 1mg/ml, 2mg/ml	+	≥6y	72 or 2mg/kg/day	0.25 to 1 mg/kg/d
	Ritalin SR * Methylin ER * Metadate ER *	20 10, 20 20	++			
	Ritalin LA *s* Metadate CD *s* Concerta * Daytrana (patch) Quillivant XR QuilliChew ER	10, 20, 30, 40 10, 20, 30, 40, 50, 60 18, 27, 36, 54 10, 15, 20, 30 /9 hrs 5mg/ml 20, 30, 40	+++			
Dex-MPH	Focalin	2.5, 5, 10	+		30 or 1 mg/kg/day	0.1 to 0.5 mg/kg/d
	Focalin XR *	5, 10, 15, 20, 25, 30, 35, 40	+++			
AMPH	Adzenys XR-ODT	3.1, 6.3, 9.4, 12.5, 15.7, 18.8	+++		18.8	
	Adderall	5, 7.5, 10, 12.5, 15, 20, 30	+	≥3y	40	
	Adderall XR *s*	5, 10, 15, 20, 25, 30	+++			
Dex-AMPH	Dexedrine	5, 10, 15	+			
	Dexedrine CR *s*	5, 10, 15	++			
	Vyvanse	20, 30, 40, 50, 60, 70	+++	≥6y	70	20-30 mg
For All: discuss risk for anorexia, insomnia, tics, ↑BP, ↑HR, arrhythmia, possible ↓terminal height						

MPH = Methylphenidate; **AMPH** = Amphetamine, * = do not crush or cut, ***c*** = chewable available, ***s*** = may be sprinkled on food. [1]Only psychotropic use approvals are listed. Medications may have other approvals in youth.

PDP, 2019

Stimulant Prescribing Notes

Pre-Screen	• Pt and family cardiovascular hx (*consult a cardiologist if patient has a structural heart defect or a family history of sudden cardiac death*) • Family history of tic disorders (stimulants may unmask) • Baseline PE, HR, BP, height & weight
Dose Titration	• q3-4 days to weekly • Short-acting forms given BID or TID; Long-acting forms given once daily • May supplement with a short-acting form after school • Last dose no later than 4pm to avoid sleep disruption
Adequate Trial	• 1 week at max dose
Monitor	• Weekly for 2-4 wks (titration period) • Monthly until "stable" then at discretion • Review HR, BP, height, weight at each visit
Prognosis	• Rule of thirds (1/3 remain syndromal, 1/3 subsyndromal, 1/3 remit) • OK to consider drug holidays
Other Notes	• Abuse/misuse potential (less w/ some formulations, e.g., Vyvanse, Concerta) • Educate parents on securing and monitoring medication use • Watch for rebound or irritability as stimulant wears off later in the day • Watch for mood deterioration despite improvement in focus and impulsivity • Higher doses may increase risk for psychosis, esp. with amphetamine class • Some forms should not be crushed, cut or chewed • Mixed data on potential for growth suppression • Recommended that patients continue on these medications during pregnancy only if they are needed to function on a daily basis

Alternatives to Stimulants

	Dosing	Notes
Atomoxetine (Strattera)	≤70 kg: 0.5 mg/kg/d; Advance to 1.2 mg/kg/d after 1-2 wks Max: 1.4 mg/kg/d or 100 mg/d >70 kg: up to 40 mg/day Advance to 60-80 mg/d after 1-2 wks Max: 100 mg/d **ir**: 10, 18, 25, 40, 60, 80, 100mg t ½ = 5 hrs	• FDA approved for ADHD in youth ≥6y • Black box warning (suicidality) • Effect not readily apparent for 2-4 weeks • Adj. dose if on CYP2D6 inhibitors • Adj. dose for hepatic insufficiency • Up to 1.6 to 1.8 mg/kg/d may be OK • Better tolerated split BID and taken with food SEs: n/v, decreased appetite, dizziness, fatigue, mood swings, headache, insomnia, hot flushing
Bupropion (Wellbutrin)	8-12y: 75mg/d ↑q1-2wk by 50-75mg Adol: 100 mg/d ↑q1-2wk by 50-100mg Max: Least of 6 mg/kg/d or 300 mg **ir**: 75, 100 mg (BID to TID) **sr**: 100, 150, 200mg (Daily) **xl**: 150, 300, 450mg (Daily) t ½ = 21 to 37 hrs	• Not FDA approved for ADHD in youth • Black box warning (suicidality) • Indications (in adult) also include intolerance to stimulants, smoking cessation, ADHD with depression, seasonal mood disorder • Lowers seizure threshold: limit to < 150mg/8hr (split BID or use slow release for higher doses) • Avoid in bulimia, anorexia, or bipolar disorder SEs: insomnia, tremor, agitation, weight loss, n/v, dizziness

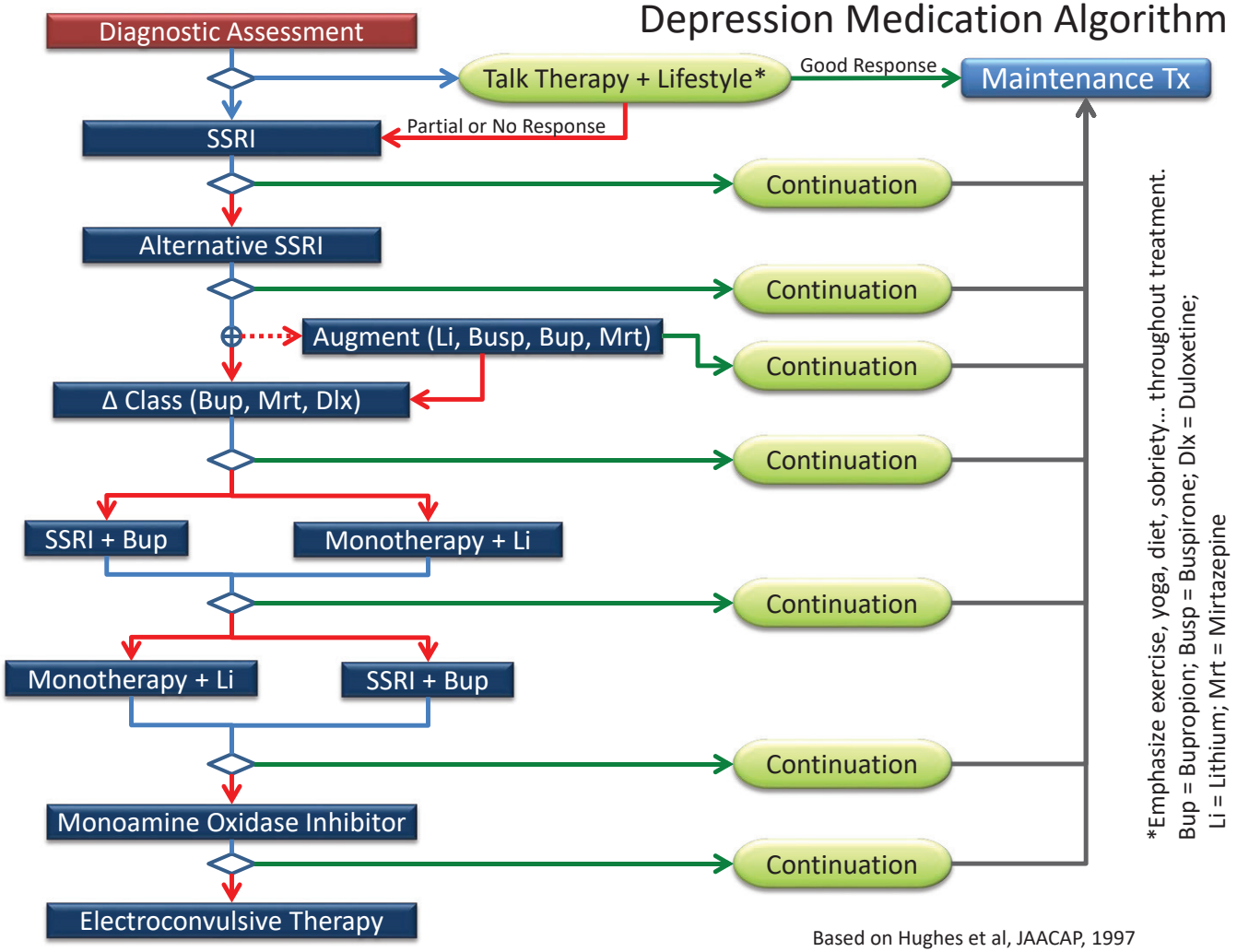
ir = immediate release; **sr** = sustained release; **xl** = extended release

Alpha-2 Agonists

	Dosing	Notes
Clonidine (Catapres, Kapvay)	Start: 0.05 to 0.1 mg at time needed ↑by 0.05 mg every 3 to 7d Typical range: 0.05 to 0.4 mg/d **ir**: 0.1, 0.2, 0.3mg (qHS to QID) **patch**: 0.1, 0.2, 0.3mg/24h (daily) **er:** (**Kapvay**) 0.1mg (daily; do not crush or chew) t ½ = 12-16 hr	• FDA approved for ADHD in youth ≥6y, but also used for tics, insomnia, agitation, aggression associated with intellectual disability or TBI, opiate withdrawal • Consider baseline EKG • Monitor BP @ baseline, dose Δ, at f/u • Rebound HTN, insomnia if stopped abruptly: taper over 1-2 wks • Caution against other PRNs if using for insomnia • **Kapvay**: more expensive, better compliance SEs: sedation, dizziness, anorexia, orthostatic HTN, ↓BP, ↓HR, depression, enuresis
Guanfacine (Tenex, Intuniv)	Start: 0.5 to 1 mg at time needed ↑by 0.5 to 1 mg per week Typical range: 0.5 to 4 mg/d **ir**: 1, 2mg (qHS to TID) **er**: (**Intuniv**) 1, 2, 3, 4mg (daily; do not crush or chew) t ½ = 17 hr	• FDA approved for ADHD in youth ≥6y; other uses similar to clonidine • Consider baseline EKG • Monitor BP @ baseline, dose Δ, at f/u • Less risk for rebound HTN (*vs* clonidine) • **Intuniv**: more expensive, better compliance SEs: less sedation than clonidine, otherwise similar

ir = immediate release; **er** = extended release

Depression Medication Algorithm



Based on Hughes et al, JAACAP, 1997

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The information on these cards is intended to offer general guidelines on psychotropic medications used to treat behavioral health conditions. It is not a substitute for specific professional medical advice.

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