

## Antipsychotic Supplemental Handout

### Oral Maintenance Dosing and Formulation Options for First Generation Antipsychotics

Agent	Usual oral dose range (mg/day)	Formulations	Comments
Chlorpromazine	400 to 600	Tab, IM	Oral absorption is variable and may require dose adjustment based on patient response. Older adults and medically ill patients are unlikely to tolerate cardiovascular, sedating, and anticholinergic side effects.
Fluphenazine	2 to 15	Tab, IM, LAI, oral solution	Oral absorption is highly variable and dose must be individualized based on patient response.
Haloperidol	2 to 20	Tab, IM, LAI, oral solution	The US labeled maximum recommended dose of 100 mg/day (oral) is considerably higher than more recent practice supports. Bioavailability with oral dosing is about 60%; dose adjustments between oral and parenteral administration should be made accordingly.
Loxapine	20 to 80	Capsule; oral inhalation for use in healthcare settings as alternative to IM injection.	Onset of oral (swallowed capsule) and IM within 30 minutes. Inhalation 10 is minutes
Perphenazine	12 to 24	Tab	Bioavailability is variable (60 to 80%)
Thiothixene¥	10 to 20	Capsule	Oral absorption is variable and dose must be individualized based on patient response.
Thioridazine	200 to 600	Tab	
Trifluoperazine¥	15 to 20	Tab	Bioavailability is variable.

¥ Smoking may decrease blood concentrations of antipsychotics primarily metabolized by CYP1A2.

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### Oral Maintenance Dosing and Formulation Options for Second Generation Antipsychotics

Agent	Usual oral dose range (mg/day)	Formulations	Comments
Aripiprazole	10 to 15	Tab, ODT, LAI, oral solution Aripiprazole lauroxil LAI	For augmentation of antidepressant, a lower daily dose of 2 to 5 mg is useful.
Asenapine¥	10 to 20	Sublingual tab	Patient should not eat or drink within 10 minutes of sublingual (SL) administration. SL preparation should not be swallowed due to poor gastrointestinal absorption.
Brexipiprazole	2 to 4	Tab	
Cariprazine	1.5 to 6	Capsule	
Clozapine¥	150 to 600	Tab, ODT, oral suspension	Hypotension is the most frequent dose limiting factor during titration. Other side effects requiring monitoring include agranulocytosis, sedation, and sialorrhea. Once titrated to 300 to 450 mg daily, rate of titration may be increased to 100 mg once or twice weekly.
Iloperidone	12 to 24	Tab	Orthostatic hypotension is usually the dose limiting factor in titration.
Lurasidone	40 to 80	Tab	Needs to be taken with a meal to be adequately absorbed.
Olanzapine¥	10 to 20	Tab, ODT, IM, LAI	
Paliperidone	6 to 12	ER tab, LAI	Tablets need to be swallowed whole.
Pimavanserin	34	Tab	Approved for reducing Parkinson disease related psychosis. Dose adjustment needed if used with strong inhibitors of CYP3A4. Efficacy may be reduced if used with strong inducers of CYP3A4.
Quetiapine	150 to 750 (immediate release) 400 to 800 (extended release)	Tab, ER tab	Titration most often limited by excessive sedation or orthostatic hypotension which should be monitored.
Risperidone	2 to 6	Tab, ODT, LAI, oral solution	
Ziprasidone	40 to 160	Capsule, IM	Oral preparation is not dependent on renal function for clearance but a component of the IM injection is cleared by the kidney.

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### First Generation Long-Acting Injectable Antipsychotics

	Fluphenazine decanoate	Haloperidol decanoate
<b>Brand Name</b>	Prolixin® Decanoate	Haldo®l Decanoate
<b>Injection interval</b>	2 to 4 weeks	4 weeks
<b>Available dosage strengths</b>	25 mg/mL (variable dose)	50 mg/mL 100 mg/mL (variable dose)
<b>Dose range</b>	12.5 to 100 mg	20 to 450 mg
<b>Maximum recommended dose</b>	100 mg every 2 weeks	450 mg every 4 weeks
<b>Conversion from oral tablets</b>	1 mg of oral daily ≈ 1.25 mg LAI every 3 weeks.	Initiate LAI at 10 to 20 times daily oral dose, up to 100 mg. If initial conversion requires >100 mg, follow by balance in 3 to 7 days. Then administer at 4-week intervals.
<b>Injection site and Technique</b>	Deltoid or gluteal Z-Track	Deltoid or gluteal Z-Track

### Second Generation Long-Acting Injectable Antipsychotics

	Aripiprazole extended release	Aripiprazole lauroxil	Olanzapine pamoate	Paliperidone palmitate (4-week)	Paliperidone palmitate (12-week)	Risperidone microspheres
<b>Brand Name</b>	Abilify® Maintena	Aristada®	Zyprexa® Relprevv	Invega® Sustenna	Invega® Trinza	Risperdal® Consta
<b>Injection interval</b>	4 weeks	4 weeks (441, 662, 882 mg) 6 weeks (882 mg only) 8 weeks (1064 mg only)	2 to 4 weeks	4 weeks	12 weeks (three months)	2 weeks
<b>Available dosage strengths</b>	300 mg 400 mg	441 mg 662 mg 882 mg 1064 mg	210 mg 300 mg 405 mg	39 mg 78 mg 117 mg 156 mg 234 mg	-- 273 mg 410 mg 546 mg 819 mg	12.5 mg 25 mg 37.5 mg 50 mg
<b>Dose range</b>	200 to 400 mg	441 to 1064 mg	150 to 405 mg	39 to 234 mg	273 to 819 mg	12.5 to 50 mg

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<b>Maximum recommended dose</b>	400 mg every 4 weeks	882 mg every 4 weeks	300 mg every 2 weeks	234 mg every 4 weeks	819 mg every 12 weeks	50 mg every 2 weeks
<b>Conversion from oral tablets</b>	Initiate LAI at 400 mg. Overlap oral aripiprazole 10 or 20 mg daily (or other oral antipsychotic) for 14 days concurrent with first LAI injection.	If stable on oral 10 mg daily, then 441 mg LAI every 4 weeks. If stable on oral 15 mg daily then 662 mg LAI every 4 weeks, or 882 mg LAI every 6 weeks, or 1064 mg LAI every 8 weeks. If stable on oral $\geq$ 20 mg daily, then 882 mg LAI every 4 weeks. Oral aripiprazole should be continued for 21 days after the first dose of LAI.	If stable on oral 10 mg daily, then 210 mg LAI every 2 weeks or 405 mg LAI every 4 weeks for first 8 weeks, then 150 mg IM LAI every 2 weeks or 300 mg every 4 weeks. If stable on oral 15 mg daily, then 300 mg LAI every 2 weeks for first 8 weeks, then 210 mg LAI every 2 weeks or 405 mg LAI every 4 weeks. If stable on oral 20 mg daily, then 300 mg LAI every 2 weeks.	Conversion from oral extended release: If stable on oral 12 mg daily, then 234 mg LAI; if 6 mg oral daily, then 117 mg LAI; if 3 mg oral daily, then 39 to 78 mg LAI.	Conversion from oral tablets is <b>not</b> available. Conversions from various doses of paliperidone palmitate 4-week LAI, once it has been established as adequate treatment	Initiate LAI at 25 mg every 2 weeks. For first 3 weeks overlap with full-dose oral treatment.
<b>Injection site and Technique</b>	Deltoid or gluteal Standard	Deltoid (441 mg only) Gluteal (441, 662, 882, or 1064 mg) Standard	Gluteal only Standard	Deltoid only (load) Deltoid or gluteal (maintenance) Standard	Deltoid or gluteal Standard	Deltoid or gluteal Standard

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### Selected Adverse Effects of Antipsychotics

	Weight gain/diabetes mellitus	Hypercholesterolemia	EPS/TD	Prolactin elevation	Sedation	Anticholinergic side effects	Orthostatic hypotension	QTc prolongation
<b>First Generation Antipsychotics</b>								
Chlorpromazine	+++	+++	+	++	+++	+++	+++	+
Fluphenazine	+	+	+++	+++	+	-/+	-	ND
Haloperidol	+	+	+++	+++	++	-/+	-	+
Loxapine	++	ND	++	++	++	+	+	+
Perphenazine	++	ND	++	++	++	+	-	ND
Thioridazine*	++	ND	+	+++	+++	++++	++++	+++
Thiothixene	++	ND	+++	++	+	+	+	+
Trifluoperazine	++	ND	+++	++	+	+	+	ND
<b>Second Generation Antipsychotics</b>								
Aripiprazole	+	-	+	-	+	-	-	-/+
Asenapine	++	-	++	++	++	-	+	+
Brexpiprazole <sup>¶</sup>	+	+	+	-/+	+	-/+	-/+	-/+
Cariprazine <sup>¶</sup>	+	-/+	++	-/+	+	-/+	-/+	-/+
Clozapine <sup>Δ</sup>	++++	++++	-/+	-/+	+++	+++	+++	+
Iloperidone	++	++	-/+	-/+	+	+	+++	++
Lurasidone	-/+	-/+	++	-/+	++	-	+	-/+
Olanzapine	++++	++++	+	+	++	++	+	+
Paliperidone	+++	+	+++	+++	+	-	++	+
Pimavanserin	+	-	-/+	-	+	+	++	+
Quetiapine	+++	+++	-/+	-/+	++	++	++	+
Risperidone	+++	+	+++	+++	+	+	+	+
Ziprasidone	-/+	-/+	+	+	+	-	+	++

\* Thioridazine is also associated with dose-dependent retinitis pigmentosa.

¶ Based upon limited experience.

Δ Clozapine also causes granulocytopenia or agranulocytosis in approximately 1 percent of patients requiring regular blood cell count monitoring. Clozapine has been associated with excess risk of myocarditis and venous thromboembolic events including fatal pulmonary embolism.