

ANSWER KEY WITH EXPLANATIONS FOR CHAPTER 10

Skill Drill Answers

SD 10.1: Drug Classification Matching

1. **A** — Haloperidol is a first-generation antipsychotic
 2. **B** — Clozapine is a second-generation antipsychotic
 3. **A** — Chlorpromazine is a first-generation antipsychotic
 4. **B** — Olanzapine is a second-generation antipsychotic
 5. **B** — Risperidone is a second-generation antipsychotic
 6. **A** — Fluphenazine is a first-generation antipsychotic
 7. **B** — Quetiapine is a second-generation antipsychotic
 8. **B** — Aripiprazole is a second-generation antipsychotic
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SD 10.2: True/False with Correction

1. **T** — FGAs have higher EPS risk due to potent D2 blockade without 5-HT_{2A} antagonism.
 2. **F** — Clozapine is reserved for TREATMENT-RESISTANT schizophrenia due to agranulocytosis risk.
 3. **F** — Lithium has a NARROW therapeutic index (0.6-1.2 mEq/L), making toxicity common.
 4. **F** — Tardive dyskinesia appears after MONTHS TO YEARS of treatment, not the first week.
 5. **T** — Olanzapine has among the highest metabolic risks of all SGAs.
 6. **F** — Lamotrigine is most effective for BIPOLAR DEPRESSION PREVENTION, not acute mania.
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SD 10.3: Fill in the Blank

1. **D2 (dopamine)**
 2. **5-HT2A (serotonin)**
 3. **agranulocytosis**
 4. **sodium**
 5. **anticholinergic**
 6. **lamotrigine**
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SD 10.4: EPS Timeline Sorting

1. **D** — Tardive dyskinesia: months to years
 2. **A** — Acute dystonia: hours to days
 3. **C** — Parkinsonism: weeks to months
 4. **B** — Akathisia: days to weeks
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SD 10.5: High vs. Low Potency FGA Sorting

1. **H** — Haloperidol is high potency
 2. **L** — Chlorpromazine is low potency
 3. **H** — Fluphenazine is high potency
 4. **L** — Thioridazine is low potency
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SD 10.6: Rapid Recall

1. **Clozapine**
 2. **D2 (dopamine D2)**
 3. **Dantrolene and/or bromocriptine**
 4. **Sodium**
 5. **Carbamazepine**
 6. **Tardive dyskinesia**
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SD 10.7: Complete the Sentence

1. **higher**
 2. **higher**
 3. **increased**
 4. **slowly**
 5. **agranulocytosis**
 6. **hyperprolactinemia**
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SD 10.8: Metabolic Risk Ranking

Clozapine: **1** (highest)

Olanzapine: **2**

Aripiprazole: **3**

Ziprasidone: **4** (lowest)

SD 10.9: Antipsychotic Adverse Effect Matching

1. **A** — EPS from nigrostriatal D2 blockade
 2. **B** — Hyperprolactinemia from tuberoinfundibular D2 blockade
 3. **C** — Sedation and weight gain from H1 antagonism
 4. **D** — Orthostatic hypotension from alpha-1 antagonism
 5. **E** — Anticholinergic effects from muscarinic antagonism
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SD 10.10: Mood Stabilizer Comparison

1. **D** — Lamotrigine is most effective for bipolar depression prevention
 2. **D** — Lamotrigine requires slow titration
 3. **A** — Lithium has narrow therapeutic index, renal excretion
 4. **C** — Carbamazepine is a CYP450 inducer
 5. **B** — Valproic acid causes neural tube defects, weight gain, hair loss
 6. **A** — Lithium causes nephrogenic diabetes insipidus
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SD 10.11: NMS vs. Serotonin Syndrome

1. **NMS** — "Lead pipe" rigidity
 2. **SS** — Hyperreflexia and clonus
 3. **NMS** — Caused by dopamine antagonists
 4. **SS** — Caused by serotonergic drugs
 5. **NMS** — Slow onset (days)
 6. **SS** — Rapid onset (hours)
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SD 10.12: Drug Selection Scenarios

1. **B** — Clozapine for treatment-resistant schizophrenia
2. **C** — Aripiprazole has lowest metabolic risk
3. **A** — Lithium (with caution and monitoring); valproic acid and carbamazepine are teratogenic

Case Study Answers

Case 10.1: Acute Dystonia and EPS Management

Question 1. The diagnosis is acute dystonia, an extrapyramidal side effect. Haloperidol is a high-potency FGA with strong D2 blockade in the nigrostriatal pathway, disrupting dopamine-acetylcholine balance and causing sustained muscle contractions.

Question 2. Immediate treatment is IV or IM anticholinergic medication—either benztropine (Cogentin) or diphenhydramine (Benadryl). Response is typically rapid (within minutes).

Question 3. Quetiapine or clozapine have the lowest EPS risk among SGAs due to lower D2 affinity. Aripiprazole (D2 partial agonist) also has low EPS risk.

Question 4. If haloperidol continues: Akathisia may develop in days to weeks; drug-induced parkinsonism in weeks to months; tardive dyskinesia with long-term use (months to years). Tardive dyskinesia may be irreversible.

Case 10.2: Lithium Toxicity

Question 1. Diarrhea and reduced fluid intake caused dehydration and sodium depletion. Since lithium competes with sodium for renal reabsorption, sodium depletion increases lithium retention, leading to toxicity.

Question 2. Mild toxicity (1.5-2.0 mEq/L): tremor, nausea, diarrhea. Moderate toxicity (2.0-2.5 mEq/L): confusion, ataxia, dysarthria, coarse tremor. Severe toxicity (>2.5 mEq/L): seizures, coma, cardiovascular collapse, death.

Question 3. Management includes stopping lithium, IV normal saline for hydration and enhanced renal excretion, supportive care, and hemodialysis for severe toxicity (levels >2.5 mEq/L or severe symptoms).

Question 4. Factors increasing lithium toxicity: Dehydration, low sodium diet, NSAIDs (decrease renal lithium clearance), ACE inhibitors/ARBs, thiazide diuretics (increase lithium reabsorption), renal impairment, and advanced age.

Diagram/Table Exercise Answers

DT 10.1: Dopamine Pathway Effects of Antipsychotics

1. Mesolimbic pathway blockade: **Reduces positive symptoms (hallucinations, delusions)**
2. Mesocortical pathway blockade: **Negative symptoms and cognitive deficits**
3. Nigrostriatal pathway blockade: **Extrapyramidal symptoms (EPS)**
4. Tuberoinfundibular pathway blockade: **Hyperprolactinemia**

DT 10.2: EPS Types and Treatment

1. Acute dystonia treatment: **Anticholinergics (benztropine, diphenhydramine)**
2. Akathisia treatment: **Beta-blocker, benzodiazepine, or reduce dose**
3. Parkinsonism treatment: **Anticholinergics or amantadine**
4. Tardive dyskinesia treatment: **Valbenazine or deutetrabenazine (VMAT2 inhibitors)**

DT 10.3: FGA vs. SGA Comparison Table

Property	First-Generation (FGA)	Second-Generation (SGA)
Primary mechanism	D2 blockade	D2 + 5-HT_{2A} blockade
EPS risk	High	Low (lower)
Metabolic risk	Low	High (higher)

Prolactin elevation	High	Variable (generally lower)
Example drugs	Haloperidol, chlorpromazine	Clozapine, olanzapine, risperidone, quetiapine, aripiprazole

DT 10.4: Mood Stabilizer Comparison Table

Drug	Best Indication	Key Adverse Effects	Monitoring Required
Lithium	Acute mania + maintenance	Tremor, polyuria, hypothyroidism, renal toxicity	Serum levels, renal, thyroid
Valproic acid	Acute mania	Weight gain, hepatotoxicity	LFTs, serum levels
Carbamazepine	Acute mania	Stevens-Johnson syndrome, aplastic anemia	CBC, serum levels
Lamotrigine	Bipolar depression prevention	Stevens-Johnson syndrome	Slow titration required

Multiple-Choice Question Answers

Question 1. Answer: B

All effective antipsychotics block D2 receptors; this is the common mechanism.

Question 2. Answer: C

Clozapine is reserved for treatment-resistant schizophrenia due to agranulocytosis risk requiring mandatory monitoring.

Question 3. Answer: C

Tardive dyskinesia involves involuntary choreiform movements, especially orofacial (lip smacking, tongue movements).

Question 4. Answer: D

Increased sodium intake actually decreases lithium levels (lithium and sodium compete for reabsorption).

Question 5. Answer: D

Lamotrigine is most effective for preventing bipolar depression; lithium is better for mania prevention.

Question 6. Answer: B

Acute dystonia is treated with IV anticholinergics (benztropine or diphenhydramine) for rapid relief.

Question 7. Answer: C

Olanzapine (and clozapine) have the highest metabolic risk among SGAs.

Question 8. Answer: D

The tuberoinfundibular pathway normally inhibits prolactin; D2 blockade here causes hyperprolactinemia.

Question 9. Answer: B

Lithium causes nephrogenic diabetes insipidus by reducing collecting duct response to ADH, causing polyuria/polydipsia.

Question 10. Answer: B

Carbamazepine requires HLA-B*15:02 screening in Asian patients due to Stevens-Johnson syndrome risk.

Question 11. Answer: B

Aripiprazole is a D2 partial agonist, stabilizing dopamine activity rather than fully blocking it.

Question 12. Answer: B

High fever, rigidity, autonomic instability, altered mental status, and elevated CK over days indicates NMS.

Question 13. Answer: B

5-HT_{2A} blockade by SGAs is thought to reduce D₂ blockade effects in the nigrostriatal pathway, lowering EPS risk.

Question 14. Answer: B

Valproic acid causes neural tube defects (spina bifida) and is contraindicated in pregnancy.

Question 15. Answer: C

Aripiprazole has the lowest metabolic risk and is appropriate for patients with diabetes or metabolic concerns.

Question 16. Answer: C

Slow lamotrigine titration reduces Stevens-Johnson syndrome risk, especially when combined with valproate.