# NEI’s Master Psychopharmacology Program
## Study Guide: Psychosis and Schizophrenia

<table>
<thead>
<tr>
<th>Subtopic</th>
<th>Benchmarks (You Should Be Able To)</th>
<th>Recommended Resources</th>
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</thead>
<tbody>
<tr>
<td>Symptom Presentation and Assessment</td>
<td>Identify and describe the five symptom domains of schizophrenia</td>
<td>Additional Resources**</td>
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<tr>
<td></td>
<td>Identify disorders in which psychosis is a defining feature</td>
<td>Stahl SM. Stahl’s essential psychopharmacology, fourth edition. New York, NY: Cambridge University Press; 2013. (Chapter 4)</td>
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<td></td>
<td>Describe neurocognitive deficits frequently seen in schizophrenia</td>
<td><strong>Ultra High Clinical Risk for Psychosis: The State of the Evidence (CME video)</strong></td>
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<td>Describe the typical course of schizophrenia, including premorbid and prodromal functioning</td>
<td><strong>This Month in Psychopharmacology, Psychosis Articles</strong></td>
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<td>Describe techniques for the clinical assessment of negative symptoms</td>
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<tr>
<td>Neurobiology of Symptoms</td>
<td>Identify the brain regions and neurotransmitters associated with each symptom domain of schizophrenia</td>
<td>Learning Activities*</td>
</tr>
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<td>Explain the mesolimbic dopamine hypothesis of positive symptoms of schizophrenia</td>
<td>Beyond the dopamine hypothesis of schizophrenia to three neural networks of psychosis: dopamine, serotonin, and glutamate (article)</td>
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<td>Explain the mesocortical dopamine hypothesis of cognitive, negative, and affective symptoms of schizophrenia</td>
<td>Additional Resources**</td>
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<td>Explain the NMDA receptor hypofunction hypothesis of schizophrenia</td>
<td>Stahl SM. Stahl’s essential psychopharmacology, fourth edition. New York, NY: Cambridge University Press; 2013. (Chapter 4)</td>
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<td>Identify genetic markers under investigation for their relevance to schizophrenia</td>
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| **M**echanisms of Conventional Antipsychotics | Identify what makes an antipsychotic conventional  
Describe the impact of conventional antipsychotics in each dopamine pathway and the corresponding clinical effects  
Identify common secondary properties of many conventional antipsychotics and their corresponding clinical effects | Additional Resources**  
| **Clinical Characteristics of Conventional Antipsychotics** | Identify currently available conventional antipsychotics  
Differentiate among conventional antipsychotics in terms of risk of different side effects  
Identify risks and benefits of long-term conventional antipsychotic use | Additional Resources**  
NEI Prescribe  
Antipsychotic medication prescribing information/package inserts. |
| **P**rimary Atypical Antipsychotic Mechanisms | Identify and explain the various mechanisms of action that make an antipsychotic atypical  
Explain the regulatory actions of 5HT2A receptors on dopamine release  
Describe the impact of serotonin dopamine antagonists in each dopamine pathway and the corresponding clinical effects  
Describe the impact of partial dopamine 2 agonists in each dopamine pathway and the corresponding clinical effects | Additional Resources**  

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| **Clinical Characteristics of Atypical Antipsychotics** | Define what makes an antipsychotic atypical in clinical terms  
Describe the clinically relevant receptor binding profiles and hypothesized corresponding clinical effects for each atypical antipsychotic  
Identify the effective dose range and general titration requirements for each atypical antipsychotic  
Differentiate among atypical antipsychotics in terms of risk of different side effects  
Identify risks and benefits of long-term atypical antipsychotic use | **Additional Resources****  
**  
**NEI Prescribe**  
| **Notable Side Effects of Antipsychotics**     | Identify receptors hypothesized to be associated with cardiometabolic risk as well as which antipsychotics have higher affinity for those receptors  
Establish a metabolic monitoring protocol for patients receiving antipsychotic medications  
Identify the warning signs for cardiometabolic parameters that warrant medical attention  
Describe the relationship between dopamine and acetylcholine in the nigrostriatal pathway  
Describe mechanisms that contribute to inducing extrapyramidal side effects (EPS) and akathisia  
Explain the hypothetical neuropathology of tardive dyskinesia  
Explain the impact of dopamine 2 antagonism on prolactin  
Describe the relationships between dopamine, serotonin, and prolactin in the tuberoinfundibular pathway  
Describe mechanisms to address the various drug-induced movement disorders  
Describe mechanisms to address prolactin elevation | **Learning Activities***  
**Managing Common Antipsychotic-induced Adverse Effects** (CME video)  
**Side Effect Management: Antipsychotic-Induced Weight Gain and Lithium-Induced Tremor** (CME video)  
**37-Year-Old Woman With Drug-Induced Akathisia** (CME case)                                                                                           | **Additional Resources****  
**  
**NEI Prescribe**  

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| **Treatment Strategies** | Describe the typical response to antipsychotic medication  
Identify pharmacological strategies for maximizing adherence to treatment  
Describe recommended treatment maintenance strategies  
Identify appropriate adjunct treatments for each symptom domain of schizophrenia  
Identify methods for management of difficult-to-treat cases  
Identify preferred treatments for individuals at risk for cardiometabolic complications  
Identify preferred treatments for individuals at risk for extrapyramidal side effects  
Identify preferred treatments for individuals at risk for prolactin elevation  
Identify preferred treatments for patients in whom sedation is undesirable  
Explain various strategies to minimize risks when switching medications  
Identify novel mechanisms and strategies being investigated for potential application to schizophrenia treatment | **Learning Activities***  
Treatment-Resistant Psychosis: What Next? (CME video)  
Dosing Depots: It Starts With Kinetics (CME animation)  
40-Year-Old Man With Psychosis and QTc Prolongation (CME case)  
24-Year-Old Man With Psychotic Relapse While on Antipsychotic Treatment (CME case)  
Identifying Risk Factors for Non-Adherence (CME video)  
**Additional Resources**  
Practical Guide for Converting to a Long-Acting Injectable Antipsychotic (CME animation)  
Optimizing Functional Outcomes in Schizophrenia: Managing Negative Symptoms, Cognitive Impairment, and Adverse Effects (CME video)  
Keeping up With the Clinical Advances: Schizophrenia (CME video)  
NEI Prescribe  
This Month in Psychopharmacology, Psychosis Articles |

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| Special Considerations | Identify methods for treating patients with aggression and/or violence  
Identify antipsychotics with an indication for use in children or adolescents  
Explain recommendations for antipsychotic selection/maintenance in women who are pregnant or breastfeeding  
Identify antipsychotics for which prescribing recommendations differ based on age  
Identify antipsychotics for which dosing recommendations are different for individuals with medical complications | Learning Activities*  
Neurobiology and Genetics of Various Types of Violence (CME video)  
Additional Resources**  
Early-Onset Psychosis (CME video)  
NEI Prescribe  
Antipsychotic medication prescribing information/package inserts.  
This Month in Psychopharmacology, Psychosis Articles |

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