

# RISPERIDONE- risperidone tablet

## Proficient Rx LP

-----

### HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use RISPERIDONE tablets safely and effectively. See full prescribing information for RISPERIDONE tablets.

RISPERIDONE tablets, for oral use

Initial U.S. Approval: 1993

#### **WARNING: INCREASED MORTALITY IN ELDERLY PATIENTS WITH DEMENTIA-RELATED PSYCHOSIS**

*See full prescribing information for complete boxed warning.*

- **Elderly patients with dementia-related psychosis treated with antipsychotic drugs are at an increased risk of death.**
- **Risperidone tablets are not approved for use in patients with dementia-related psychosis. (5.1)**

### INDICATIONS AND USAGE

Risperidone tablets are atypical antipsychotic indicated for:

- Treatment of schizophrenia (1.1)
- As monotherapy or adjunctive therapy with lithium or valproate, for the treatment of acute manic or mixed episodes associated with Bipolar I Disorder (1.2)
- Treatment of irritability associated with autistic disorder (1.3)

### DOSAGE AND ADMINISTRATION

- Recommended daily dosage:

	Initial Dose	Target Dose	Effective Dose Range
Schizophrenia: adults (2.1)	2 mg	4 to 8 mg	4 to 16 mg
Schizophrenia: adolescents (2.1)	0.5 mg	3 mg	1 to 6 mg
Bipolar mania: Adults (2.2)	2 to 3 mg	1 to 6 mg	1 to 6 mg
Bipolar mania: in children and adolescents (2.2)	0.5 mg	1 to 2.5 mg	1 to 6 mg
Irritability associated with autistic disorder (2.3)	0.25 mg (Weight < 20 kg)	0.5 mg (<20 kg)	0.5 to 3 mg
	0.5 mg (Weight ≥20 kg)	1 mg (≥20 kg)	

- Severe Renal or Hepatic Impairment in Adults: Use a lower starting dose of 0.5 mg twice daily. May increase to dosages above 1.5 mg twice daily at intervals of at least one week. (2.4)

### DOSAGE FORMS AND STRENGTHS

- Tablets: 0.25 mg, 0.5 mg, 1 mg, 2 mg, 3 mg, and 4 mg (3)

### CONTRAINDICATIONS

- Known hypersensitivity to risperidone tablets (4)

### WARNINGS AND PRECAUTIONS

- Cerebrovascular events, including stroke, in elderly patients with dementia-related psychosis: Risperidone tablets are not approved for use in patients with dementia-related psychosis (5.2)
- Neuroleptic Malignant Syndrome: Manage with immediate discontinuation of risperidone tablets and

close monitoring. (5.3)

- Tardive dyskinesia: Consider discontinuing risperidone tablets if clinically indicated. (5.4)
- Metabolic Changes: Atypical antipsychotic drugs have been associated with metabolic changes that may increase cardiovascular / cerebrovascular risk. These metabolic changes include hyperglycemia, dyslipidemia and weight gain. (5.5)
  - o *Hyperglycemia and Diabetes Mellitus*: Monitor patients for symptoms of hyperglycemia including polydipsia, polyuria, polyphagia and weakness. Monitor glucose regularly in patients with diabetes or at risk for diabetes. (5.5)
  - o *Dyslipidemia*: Undesirable alterations have been observed in patients treated with atypical antipsychotics. (5.5)
  - o *Weight Gain*: Significant weight gain has been reported. Monitor weight gain. (5.5)
- Hyperprolactinemia: Prolactin elevations occur and persist during chronic administration. (5.6)
- Orthostatic hypotension: For patients at risk, consider a lower starting dose and slower titration. (5.7)
- Leukopenia, Neutropenia, and Agranulocytosis: Perform complete blood counts in patients with a history of clinically significant low white blood cell count (WBC). Consider discontinuing risperidone tablets if a clinically significant decline in WBC occurs in the absence of other causative factors. (5.8)
- Potential for cognitive and motor impairment: Use caution when operating machinery. (5.9)
- Seizures: Use cautiously in patients with a history of seizures or with conditions that lower the seizure threshold. (5.10)

#### ADVERSE REACTIONS

The most common adverse reactions in clinical trials ( $\geq 5\%$  and twice placebo) were parkinsonism, akathisia, dystonia, tremor, sedation, dizziness, anxiety, blurred vision, nausea, vomiting, upper abdominal pain, stomach discomfort, dyspepsia, diarrhea, salivary hypersecretion, constipation, dry mouth, increased appetite, increased weight, fatigue, rash, nasal congestion, upper respiratory tract infection, nasopharyngitis, and pharyngolaryngeal pain. (6)

**To report SUSPECTED ADVERSE REACTIONS, contact Ajanta Pharma USA Inc. at 855-664-7744 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch)**

#### DRUG INTERACTIONS

- Carbamazepine and other enzyme inducers decrease plasma concentrations of risperidone. Increase the risperidone tablets dose up to double the patient's usual dose. Titrate slowly. (7.1)
- Fluoxetine, paroxetine, and other CYP 2D6 enzyme inhibitors increase plasma concentrations of risperidone. Reduce the initial dose. Do not exceed a final dose of 8 mg per day of risperidone tablets. (7.1)

#### USE IN SPECIFIC POPULATIONS

- Pregnancy: Based on animal data, may cause fetal harm. (8.1)
- Nursing Mothers: Discontinue drug or nursing, taking into consideration the importance of drug to the mother. (8.3)

**See 17 for PATIENT COUNSELING INFORMATION.**

**Revised: 10/2022**

---

## FULL PRESCRIBING INFORMATION: CONTENTS\*

### WARNING: INCREASED MORTALITY IN ELDERLY PATIENTS WITH DEMENTIA-RELATED PSYCHOSIS

#### 1 INDICATIONS AND USAGE

1.1 Schizophrenia

1.2 Bipolar Mania

1.3 Irritability Associated with Autistic Disorder

#### 2 DOSAGE AND ADMINISTRATION

2.1 Schizophrenia

2.2 Bipolar Mania

2.3 Irritability Associated with Autistic Disorder - Pediatrics (Children and Adolescents)

2.4 Dosing in Patients with Severe Renal or Hepatic Impairment

2.5 Dose Adjustments for Specific Drug Interactions

### **3 DOSAGE FORMS AND STRENGTHS**

### **4 CONTRAINDICATIONS**

### **5 WARNINGS AND PRECAUTIONS**

5.1 Increased Mortality in Elderly Patients with Dementia-Related Psychosis

5.2 Cerebrovascular Adverse Reactions, Including Stroke, in Elderly Patients with Dementia-Related Psychosis

5.3 Neuroleptic Malignant Syndrome

5.4 Tardive Dyskinesia

5.5 Metabolic Changes

5.6 Hyperprolactinemia

5.7 Orthostatic Hypotension

5.8 Leukopenia, Neutropenia, and Agranulocytosis

5.9 Potential for Cognitive and Motor Impairment

5.10 Seizures

5.11 Dysphagia

5.12 Priapism

5.13 Body Temperature Regulation

### **6 ADVERSE REACTIONS**

6.1 Clinical Trials Experience

6.2 Postmarketing Experience

### **7 DRUG INTERACTIONS**

7.1 Pharmacokinetic-related Interactions

7.2 Pharmacodynamic-related Interactions

### **8 USE IN SPECIFIC POPULATIONS**

8.1 Pregnancy

8.2 Labor & Delivery

8.3 Nursing Mothers

8.4 Pediatric Use

8.5 Geriatric Use

8.6 Renal Impairment

8.7 Hepatic Impairment

8.8 Patients with Parkinsons Disease or Lewy Body Dementia

### **9 DRUG ABUSE AND DEPENDENCE**

9.1 Controlled Substance

9.2 Abuse

9.3 Dependence

### **10 OVERDOSAGE**

10.1 Human Experience

10.2 Management of Overdosage

### **11 DESCRIPTION**

### **12 CLINICAL PHARMACOLOGY**

12.1 Mechanism of Action

12.2 Pharmacodynamics

12.3 Pharmacokinetics

### **13 NONCLINICAL TOXICOLOGY**

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

13.2 Animal Toxicology

## **14 CLINICAL STUDIES**

14.1 Schizophrenia

14.2 Bipolar Mania - Monotherapy

14.3 Bipolar Mania - Adjunctive Therapy with Lithium or Valproate

14.4 Irritability Associated with Autistic Disorder

## **16 HOW SUPPLIED/STORAGE AND HANDLING**

16.1 How Supplied

16.2 Storage and Handling

## **17 PATIENT COUNSELING INFORMATION**

17.1 Orthostatic Hypotension

17.2 Interference with Cognitive and Motor Performance

17.3 Pregnancy

17.4 Nursing

17.5 Concomitant Medication

17.6 Alcohol

17.8 Metabolic Changes

17.9 Tardive Dyskinesia

\* Sections or subsections omitted from the full prescribing information are not listed.

---

## **FULL PRESCRIBING INFORMATION**

### **WARNING: INCREASED MORTALITY IN ELDERLY PATIENTS WITH DEMENTIA-RELATED PSYCHOSIS**

**Elderly patients with dementia-related psychosis treated with antipsychotic drugs are at an increased risk of death. Risperidone tablets are not approved for the treatment of patients with dementia-related psychosis. [See Warnings and Precautions (5.1)]**

## **1 INDICATIONS AND USAGE**

### **1.1 Schizophrenia**

Risperidone tablets are indicated for the treatment of schizophrenia. Efficacy was established in 4 short-term trials in adults, 2 short-term trials in adolescents (ages 13 to 17 years), and one long-term maintenance trial in adults [see *Clinical Studies (14.1)*].

### **1.2 Bipolar Mania**

#### Monotherapy

Risperidone tablets are indicated for the treatment of acute manic or mixed episodes associated with Bipolar I Disorder. Efficacy was established in 2 short-term trials in adults and one short-term trial in children and adolescents (ages 10 to 17 years)[see

*Clinical Studies (14.2)].*

### Adjunctive Therapy

Risperidone tablets adjunctive therapy with lithium or valproate is indicated for the treatment of acute manic or mixed episodes associated with Bipolar I Disorder. Efficacy was established in one short-term trial in adults [see *Clinical Studies (14.3)*].

### **1.3 Irritability Associated with Autistic Disorder**

Risperidone tablets are indicated for the treatment of irritability associated with autistic disorder, including symptoms of aggression towards others, deliberate self-injuriousness, temper tantrums, and quickly changing moods. Efficacy was established in 3 short-term trials in children and adolescents (ages 5 to 17 years) [see *Clinical Studies (14.4)*].

## **2 DOSAGE AND ADMINISTRATION**

**Table 1. Recommended Daily Dosage by Indication**

	<b>Initial Dose</b>	<b>Titration (Increments)</b>	<b>Target Dose</b>	<b>Effective Dose Range</b>
<b>Schizophrenia: adults (2.1)</b>	2 mg	1 to 2 mg	4 to 8 mg	4 to 16 mg
<b>Schizophrenia: adolescents (2.2)</b>	0.5 mg	0.5 to 1 mg	3 mg	1 to 6 mg
<b>Bipolar mania: adults (2.2)</b>	2 to 3 mg	1 mg	1 to 6 mg	1 to 6 mg
<b>Bipolar mania: children and adolescents (2.2)</b>	0.5 mg	0.5 to 1 mg	1 to 2.5 mg	1 to 6 mg
<b>Irritability in autistic disorder (2.3)</b>	0.25 mg Can increase to 0.5 mg by Day 4: (body weight less than 20 kg)  0.5 mg Can increase to 1 mg by Day 4: (body weight greater than or equal to 20 kg)	After Day 4, at Interval of > 2 weeks: 0.25 mg (body weight less than 20 kg)  0.5 mg (body weight greater than or equal to 20 kg)	0.5 mg: (body weight less than 20 kg)  1 mg: (body weight greater than or equal to 20 kg)	0.5 to 3 mg

Severe Renal and Hepatic Impairment in Adults: use a lower starting dose of 0.5 mg twice daily.

May increase to dosages above 1.5 mg twice daily at intervals of one week or longer.

## **2.1 Schizophrenia**

### Adults

#### Usual Initial Dose

Risperidone tablets can be administered once or twice daily. Initial dosing is 2 mg per day. May increase the dose at intervals of 24 hours or greater, in increments of 1 to 2 mg per day, as tolerated, to a recommended dose of 4 to 8 mg per day. In some patients, slower titration may be appropriate. Efficacy has been demonstrated in a range of 4 mg to 16 mg per day. However, doses above 6 mg per day for twice daily dosing were not demonstrated to be more efficacious than lower doses, were associated with more extrapyramidal symptoms and other adverse effects, and are generally not recommended. In a single study supporting once-daily dosing, the efficacy results were generally stronger for 8 mg than for 4 mg. The safety of doses above 16 mg per day has not been evaluated in clinical trials [see *Clinical Studies (14.1)*].

### Adolescents

The initial dose is 0.5 mg once daily, administered as a single-daily dose in the morning or evening. The dose may be adjusted at intervals of 24 hours or greater, in increments of 0.5 mg or 1 mg per day, as tolerated, to a recommended dose of 3 mg per day. Although efficacy has been demonstrated in studies of adolescent patients with schizophrenia at doses between 1 mg and 6 mg per day, no additional benefit was observed above 3 mg per day, and higher doses were associated with more adverse events. Doses higher than 6 mg per day have not been studied.

Patients experiencing persistent somnolence may benefit from administering half the daily dose twice daily.

### Maintenance Therapy

While it is unknown how long a patient with schizophrenia should remain on risperidone tablets, the effectiveness of risperidone tablets 2 mg per day to 8 mg per day at delaying relapse was demonstrated in a controlled trial in adult patients who had been clinically stable for at least 4 weeks and were then followed for a period of 1 to 2 years [see *Clinical Studies (14.1)*]. Both adult and adolescent patients who respond acutely should generally be maintained on their effective dose beyond the acute episode. Patients should be periodically reassessed to determine the need for maintenance treatment.

### Reinitiation of Treatment in Patients Previously Discontinued

Although there are no data to specifically address reinitiation of treatment, it is recommended that after an interval off risperidone tablets, the initial titration schedule should be followed.

### Switching From Other Antipsychotics

There are no systematically collected data to specifically address switching schizophrenic patients from other antipsychotics to risperidone tablets, or treating patients with concomitant antipsychotics.

## **2.2 Bipolar Mania**

### Usual Dose

## Adults

The initial dose range is 2 mg to 3 mg per day. The dose may be adjusted at intervals of 24 hours or greater, in increments of 1 mg per day. The effective dose range is 1 mg to 6 mg per day, as studied in the short-term, placebo-controlled trials. In these trials, short-term (3 week) anti-manic efficacy was demonstrated in a flexible dosage range of 1 mg to 6 mg per day [see *Clinical Studies (14.2,14.3)*]. Risperidone tablets doses higher than 6 mg per day were not studied.

## Pediatrics

The initial dose is 0.5 mg once daily, administered as a single-daily dose in the morning or evening. The dose may be adjusted at intervals of 24 hours or greater, in increments of 0.5 mg or 1 mg per day, as tolerated, to the recommended target dose of 1 mg to 2.5 mg per day. Although efficacy has been demonstrated in studies of pediatric patients with bipolar mania at doses between 0.5 mg and 6 mg per day, no additional benefit was observed above 2.5 mg per day, and higher doses were associated with more adverse events. Doses higher than 6 mg per day have not been studied.

Patients experiencing persistent somnolence may benefit from administering half the daily dose twice daily.

## Maintenance Therapy

There is no body of evidence available from controlled trials to guide a clinician in the longer-term management of a patient who improves during treatment of an acute manic episode with risperidone tablets. While it is generally agreed that pharmacological treatment beyond an acute response in mania is desirable, both for maintenance of the initial response and for prevention of new manic episodes, there are no systematically obtained data to support the use of risperidone tablets in such longer-term treatment (i.e., beyond 3 weeks). The physician who elects to use risperidone tablets for extended periods should periodically re-evaluate the long-term risks and benefits of the drug for the individual patient.

### **2.3 Irritability Associated with Autistic Disorder - Pediatrics (Children and Adolescents)**

The dosage of risperidone tablets should be individualized according to the response and tolerability of the patient. The total daily dose of risperidone tablets can be administered once daily, or half the total daily dose can be administered twice daily.

For patients with body weight less than 20 kg, initiate dosing at 0.25 mg per day. For patients with body weight greater than or equal to 20 kg, initiate dosing at 0.5 mg per day. After a minimum of four days, the dose may be increased to the recommended dose of 0.5 mg per day for patients less than 20 kg and 1.0 mg per day for patients greater than or equal to 20 kg. Maintain this dose for a minimum of 14 days. In patients not achieving sufficient clinical response, the dose may be increased at intervals of 2 weeks or greater, in increments of 0.25 mg per day for patients less than 20 kg, or increments of 0.5 mg per day for patients greater than or equal to 20 kg. The effective dose range is 0.5 mg to 3 mg per day. No dosing data are available for children who weigh less than 15 kg.

Once sufficient clinical response has been achieved and maintained, consider gradually lowering the dose to achieve the optimal balance of efficacy and safety. The physician

who elects to use risperidone tablets for extended periods should periodically re-evaluate the long-term risks and benefits of the drug for the individual patient.

Patients experiencing persistent somnolence may benefit from a once-daily dose administered at bedtime or administering half the daily dose twice daily, or a reduction of the dose.

## **2.4 Dosing in Patients with Severe Renal or Hepatic Impairment**

For patients with severe renal impairment ( $CL_{cr} < 30$  mL/min) or hepatic impairment (10-15 points on Child Pugh System), the initial starting dose is 0.5 mg twice daily. The dose may be increased in increments of 0.5 mg or less, administered twice daily. For doses above 1.5 mg twice daily, increase in intervals of one week or greater [see *Use in Specific Populations (8.6 and 8.7)*].

## **2.5 Dose Adjustments for Specific Drug Interactions**

When risperidone tablets are co-administered with enzyme inducers (e.g., carbamazepine), the dose of risperidone tablets should be increased up to double the patient's usual dose. It may be necessary to decrease the risperidone tablets dose when enzyme inducers such as carbamazepine are discontinued [see *Drug Interactions (7.1)*]. Similar effect may be expected with co-administration of risperidone tablets with other enzyme inducers (e.g., phenytoin, rifampin, and phenobarbital).

When fluoxetine or paroxetine is co-administered with risperidone tablets, the dose of risperidone tablets should be reduced. The risperidone tablets dose should not exceed 8 mg per day in adults when co-administered with these drugs. When initiating therapy, risperidone tablets should be titrated slowly. It may be necessary to increase the risperidone tablets dose when enzyme inhibitors such as fluoxetine or paroxetine are discontinued [see *Drug Interactions (7.1)*].

## **3 DOSAGE FORMS AND STRENGTHS**

Risperidone tablets USP are available in the following strengths and colors: 0.25 mg (orange), 0.5 mg (orange), 1 mg (white), 2 mg (yellow), 3 mg (orange), and 4 mg (brown). 0.25 mg, 0.5 mg, 1 mg and 2 mg are circular shaped. 3 mg are capsule shaped and 4 mg in ovaloid shaped. Risperidone tablets USP are engraved with "RI1", "RI2", "RI3", "RI4", "RI5" and "RI6" on one side on "0.25", "0.5", "1", "2", "3" and "4" respectively and plain on other side.

## **4 CONTRAINDICATIONS**

Risperidone tablets are contraindicated in patients with a known hypersensitivity to the risperidone tablets. Hypersensitivity reactions, including anaphylactic reactions and angioedema, have been observed in patients treated with risperidone.

## **5 WARNINGS AND PRECAUTIONS**

### **5.1 Increased Mortality in Elderly Patients with Dementia-Related Psychosis**

Elderly patients with dementia-related psychosis treated with antipsychotic drugs are at



an increased risk of death. Analyses of 17 placebo-controlled trials (modal duration of 10 weeks), largely in patients taking atypical antipsychotic drugs, revealed a risk of death in drug-treated patients of between 1.6 to 1.7 times the risk of death in placebo-treated patients. Over the course of a typical 10-week controlled trial, the rate of death in drug-treated patients was about 4.5%, compared to a rate of about 2.6% in the placebo group. Although the causes of death were varied, most of the deaths appeared to be either cardiovascular (e.g., heart failure, sudden death) or infectious (e.g., pneumonia) in nature. Observational studies suggest that, similar to atypical antipsychotic drugs, treatment with conventional antipsychotic drugs may increase mortality. The extent to which the findings of increased mortality in observational studies may be attributed to the antipsychotic drug as opposed to some characteristic(s) of the patients is not clear.

In two of four placebo-controlled trials in elderly patients with dementia-related psychosis, a higher incidence of mortality was observed in patients treated with furosemide plus risperidone tablets when compared to patients treated with risperidone tablets alone or with placebo plus furosemide. No pathological mechanism has been identified to explain this finding, and no consistent pattern for cause of death was observed.

Risperidone tablets are not approved for the treatment of dementia-related psychosis [see *Boxed Warning*].

## **5.2 Cerebrovascular Adverse Reactions, Including Stroke, in Elderly Patients with Dementia-Related Psychosis**

Cerebrovascular adverse reactions (e.g., stroke, transient ischemic attack), including fatalities, were reported in patients (mean age 85 years; range 73-97) in trials of risperidone in elderly patients with dementia-related psychosis. In placebo-controlled trials, there was a significantly higher incidence of cerebrovascular adverse events in patients treated with risperidone compared to patients treated with placebo. Risperidone tablets are not approved for the treatment of patients with dementia-related psychosis. [see *Boxed Warning and Warnings and Precautions (5.1)*]

## **5.3 Neuroleptic Malignant Syndrome**

Antipsychotic drugs including risperidone tablets can cause a potentially fatal symptom complex referred to as Neuroleptic Malignant Syndrome (NMS). Clinical manifestations of NMS include hyperpyrexia, muscle rigidity, altered mental status, and autonomic instability (irregular pulse or blood pressure, tachycardia, diaphoresis, and cardiac dysrhythmia). Additional signs may include elevated creatine phosphokinase (CPK), myoglobinuria, rhabdomyolysis, and acute renal failure.

The diagnostic evaluation of patients with this syndrome is complicated. In arriving at a diagnosis, it is important to identify cases in which the clinical presentation includes both serious medical illness (e.g., pneumonia, systemic infection, etc.) and untreated or inadequately treated extrapyramidal signs and symptoms (EPS). Other important considerations in the differential diagnosis include central anticholinergic toxicity, heat stroke, drug fever, and primary central nervous system pathology.

The management of NMS should include: (1) immediate discontinuation of antipsychotic drugs and other drugs not essential to concurrent therapy; (2) intensive symptomatic treatment and medical monitoring; and (3) treatment of any concomitant serious medical problems for which specific treatments are available. There is no general

agreement about specific pharmacological treatment regimens for uncomplicated NMS.

If a patient requires antipsychotic drug treatment after recovery from NMS, the potential reintroduction of drug therapy should be carefully considered. The patient should be carefully monitored, since recurrences of NMS have been reported.

## **5.4 Tardive Dyskinesia**

A syndrome of potentially irreversible, involuntary, dyskinetic movements may develop in patients treated with antipsychotic drugs. The risk of developing tardive dyskinesia and the likelihood that it will become irreversible are believed to increase as the duration of treatment and the total cumulative dose of antipsychotic drugs administered to the patient increase. However, the syndrome can develop, although much less commonly, after relatively brief treatment periods at low doses.

There is no known treatment for established cases of tardive dyskinesia, although the syndrome may remit, partially or completely, if antipsychotic treatment is withdrawn. Antipsychotic treatment, itself, however, may suppress (or partially suppress) the signs and symptoms of the syndrome and thereby may possibly mask the underlying process. The effect that symptomatic suppression has upon the long-term course of the syndrome is unknown.

Given these considerations, prescribe risperidone tablets in a manner that is most likely to minimize the occurrence of tardive dyskinesia. Chronic antipsychotic treatment should generally be reserved for patients who suffer from a chronic illness that: (1) is known to respond to antipsychotic drugs, and (2) for whom alternative, equally effective, but potentially less harmful treatments are not available or appropriate. In patients who do require chronic treatment, the smallest dose and the shortest duration of treatment producing a satisfactory clinical response should be sought. The need for continued treatment should be reassessed periodically.

If signs and symptoms of tardive dyskinesia appear in a patient treated with risperidone tablets, consider drug discontinuation. However, some patients may require treatment with risperidone tablets despite the presence of the syndrome.

## **5.5 Metabolic Changes**

Atypical antipsychotic drugs have been associated with metabolic changes that may increase cardiovascular/cerebrovascular risk. These metabolic changes include hyperglycemia, dyslipidemia, and body weight gain. While all of the drugs in the class have been shown to produce some metabolic changes, each drug has its own specific risk profile.

### Hyperglycemia and Diabetes Mellitus

Hyperglycemia and diabetes mellitus, in some cases extreme and associated with ketoacidosis or hyperosmolar coma or death, have been reported in patients treated with atypical antipsychotics including risperidone tablets. Assessment of the relationship between atypical antipsychotic use and glucose abnormalities is complicated by the possibility of an increased background risk of diabetes mellitus in patients with schizophrenia and the increasing incidence of diabetes mellitus in the general population. Given these confounders, the relationship between atypical antipsychotic use and hyperglycemia-related adverse events is not completely understood. However, epidemiological studies suggest an increased risk of treatment-emergent hyperglycemia-

related adverse events in patients treated with the atypical antipsychotics. Precise risk estimates for hyperglycemia-related adverse events in patients treated with atypical antipsychotics are not available.

Patients with an established diagnosis of diabetes mellitus who are started on atypical antipsychotics, including risperidone tablets, should be monitored regularly for worsening of glucose control. Patients with risk factors for diabetes mellitus (e.g., obesity, family history of diabetes) who are starting treatment with atypical antipsychotics, including risperidone tablets, should undergo fasting blood glucose testing at the beginning of treatment and periodically during treatment. Any patient treated with atypical antipsychotics, including risperidone tablets, should be monitored for symptoms of hyperglycemia including polydipsia, polyuria, polyphagia, and weakness. Patients who develop symptoms of hyperglycemia during treatment with atypical antipsychotics, including risperidone tablets, should undergo fasting blood glucose testing. In some cases, hyperglycemia has resolved when the atypical antipsychotic, including risperidone tablets, was discontinued; however, some patients required continuation of anti-diabetic treatment despite discontinuation of risperidone tablets.

Pooled data from three double-blind, placebo-controlled schizophrenia studies and four double-blind, placebo-controlled bipolar monotherapy studies are presented in Table 2.

Table 2. Change in Random Glucose from Seven Placebo-Controlled, 3- to 8-Week, Fixed- or Flexible-Dose Studies in Adult Subjects with Schizophrenia or Bipolar Mania

	Placebo	Risperidone Tablets	
		1-8 mg/day	>8-16 mg/day
	<b>Mean change from baseline (mg/dL)</b>		
Serum Glucose	<b>n=555</b> -1.4	<b>n=748</b> 0.8	<b>n=164</b> 0.6
	<b>Proportion of patients with shifts</b>		
Serum Glucose (<140 mg/dL to ≥200 mg/dL)	0.6% (3/525)	0.4% (3/702)	0% (0/158)

In longer-term, controlled and uncontrolled studies, risperidone tablets were associated with a mean change in glucose of +2.8 mg/dL at Week 24 (n=151) and +4.1 mg/dL at Week 48 (n=50).

Data from the placebo-controlled 3- to 6-week study in children and adolescents with schizophrenia (13–17 years of age), bipolar mania (10–17 years of age), or autistic disorder (5 to 17 years of age) are presented in Table 3.

Table 3. Change in Fasting Glucose from Three Placebo-Controlled, 3- to 6-Week, Fixed-Dose Studies in Children and Adolescents with Schizophrenia (13–17 years of age), Bipolar Mania (10–17 years of age), or Autistic Disorder (5 to 17 years of age)

	Placebo	Risperidone Tablets 0.5-6 mg/day
	<b>Mean change from baseline (mg/dL)</b>	

Serum Glucose	<b>n=76</b> -1.3	<b>n=135</b> 2.6
	<b>Proportion of patients with shifts</b>	
Serum Glucose (<100 mg/dL to ≥126 mg/dL)	0% (0/64)	0.8% (1/120)

In longer-term, uncontrolled, open-label extension pediatric studies, risperidone tablets were associated with a mean change in fasting glucose of +5.2 mg/dL at Week 24 (n=119).

### Dyslipidemia

Undesirable alterations in lipids have been observed in patients treated with atypical antipsychotics.

Pooled data from 7 placebo-controlled, 3- to 8- week, fixed- or flexible-dose studies in adult subjects with schizophrenia or bipolar mania are presented in Table 4.

Table 4. Change in Random Lipids from Seven Placebo-Controlled, 3- to 8-Week, Fixed- or Flexible-Dose Studies in Adult Subjects with Schizophrenia or Bipolar Mania

	Placebo	Risperidone Tablets	
		1-8 mg/day	>8-16 mg/day
<b>Mean change from baseline (mg/dL)</b>			
<b>Cholesterol</b>	<b>n=559</b>	<b>n=742</b>	<b>n=156</b>
Change from baseline	0.6	6.9	1.8
<b>Triglycerides</b>	<b>n=183</b>	<b>n=307</b>	<b>n=123</b>
Change from baseline	-17.4	-4.9	-8.3
<b>Proportion of patients with shifts</b>			
<b>Cholesterol</b> (<200 mg/dL to ≥240 mg/dL)	2.7% (10/368)	4.3% (22/516)	6.3% (6/96)
<b>Triglycerides</b> (<500 mg/dL to ≥500 mg/dL)	1.1% (2/180)	2.7% (8/301)	2.5% (3/121)

In longer-term, controlled and uncontrolled studies, risperidone tablets were associated with a mean change in (a) non-fasting cholesterol of +4.4 mg/dL at Week 24 (n=231) and +5.5 mg/dL at Week 48 (n=86); and (b) non-fasting triglycerides of +19.9 mg/dL at Week 24 (n=52).

Pooled data from 3 placebo-controlled, 3- to 6-week, fixed-dose studies in children and adolescents with schizophrenia (13-17 years of age), bipolar mania (10-17 years of age), or autistic disorder (5-17 years of age) are presented in Table 5.

Table 5. Change in Fasting Lipids from Three Placebo-Controlled, 3- to 6-Week, Fixed-Dose Studies in Children and Adolescents with Schizophrenia (13-17 Years of Age), Bipolar Mania (10-17 Years of Age), or Autistic Disorder (5 to 17 Years of

Age)

	Placebo	Risperidone Tablets 0.5-6 mg/day
	<b>Mean change from baseline</b>	
	<b>(mg/dL)</b>	
<b>Cholesterol</b>	<b>n=74</b>	<b>n=133</b>
Change from baseline	0.3	-0.3
<b>LDL</b>	<b>n=22</b>	<b>n=22</b>
Change from baseline	3.7	0.5
<b>HDL</b>	<b>n=22</b>	<b>n=22</b>
Change from baseline	1.6	-1.9
<b>Triglycerides</b>	<b>n=77</b>	<b>n=138</b>
Change from baseline	-9.0	-2.6
	<b>Proportion of patients with</b>	
	<b>shifts</b>	
<b>Cholesterol</b>	2.4%	3.8%
(<170 mg/dL to ≥200 mg/dL)	(1/42)	(3/80)
<b>LDL</b>	0%	0%
(<110 mg/dL to ≥130 mg/dL)	(0/16)	(0/16)
<b>HDL</b>	0%	10%
(≥40 mg/dL to <40 mg/dL)	(0/19)	(2/20)
<b>Triglycerides</b>	1.5%	7.1%
(<150 mg/dL to ≥200 mg/dL)	(1/65)	(8/113)

In longer-term, uncontrolled, open-label extension pediatric studies, risperidone tablets were associated with a mean change in (a) fasting cholesterol of +2.1 mg/dL at Week 24 (n=114); (b) fasting LDL of -0.2 mg/dL at Week 24 (n=103); (c) fasting HDL of +0.4 mg/dL at Week 24 (n=103); and (d) fasting triglycerides of +6.8 mg/dL at Week 24 (n=120).

### Weight Gain

Weight gain has been observed with atypical antipsychotic use. Clinical monitoring of weight is recommended.

Data on mean changes in body weight and the proportion of subjects meeting a weight gain criterion of 7% or greater of body weight from 7 placebo-controlled, 3- to 8- week, fixed- or flexible-dose studies in adult subjects with schizophrenia or bipolar mania are presented in Table 6.

Table 6. Mean Change in Body Weight (kg) and the Proportion of Subjects with ≥7% Gain in Body Weight From Seven Placebo-Controlled, 3- to 8-Week, Fixed- or Flexible-Dose Studies in Adult Subjects With Schizophrenia or Bipolar Mania

	Placebo (n=597)	Risperidone Tablets	
		1-8 mg/day	>8-16 mg/day

		(n=769)	(n=158)
<b>Weight (kg)</b>			
Change from baseline	-0.3	0.7	2.2
<b>Weight Gain</b>			
≥7% increase from baseline	2.9%	8.7%	20.9%

In longer-term, controlled and uncontrolled studies, risperidone tablets were associated with a mean change in weight of +4.3 kg at Week 24 (n=395) and +5.3 kg at Week 48 (n=203).

Data on mean changes in body weight and the proportion of subjects meeting the criterion of ≥7% gain in body weight from nine placebo-controlled, 3- to 8-week, fixed-dose studies in children and adolescents with schizophrenia (13–17 years of age), bipolar mania (10–17 years of age), autistic disorder (5–17 years of age), or other psychiatric disorders (5–17 years of age) are presented in Table 7.

Table 7. Mean Change in Body Weight (kg) and the Proportion of Subjects With ≥7% Gain in Body Weight From Nine Placebo-Controlled, 3- to 8-Week, Fixed-Dose Studies in Children and Adolescents With Schizophrenia (13–17 Years of Age), Bipolar Mania (10–17 Years of Age), Autistic Disorder (5 to 17 Years of Age) or Other Psychiatric Disorders (5–17 Years of Age)

	<b>Placebo (n=375)</b>	<b>Risperidone Tablets 0.5-6 mg/day (n=448)</b>
<b>Weight (kg)</b>		
Change from baseline	0.6	2.0
<b>Weight Gain</b>		
≥7% increase from baseline	6.9%	32.6%

In longer-term, uncontrolled, open-label extension pediatric studies, risperidone tablets were associated with a mean change in weight of +5.5 kg at Week 24 (n=748) and +8.0 kg at Week 48 (n=242).

In a long-term, open-label extension study in adolescent patients with schizophrenia, weight increase was reported as a treatment-emergent adverse event in 14% of patients. In 103 adolescent patients with schizophrenia, a mean increase of 9.0 kg was observed after 8 months of risperidone tablets treatment. The majority of that increase was observed within the first 6 months. The average percentiles at baseline and 8 months, respectively, were 56 and 72 for weight, 55 and 58 for height, and 51 and 71 for body mass index.

In long-term, open-label trials (studies in patients with autistic disorder or other psychiatric disorders), a mean increase of 7.5 kg after 12 months of risperidone tablets treatment was observed, which was higher than the expected normal weight gain (approximately 3 to 3.5 kg per year adjusted for age, based on Centers for Disease Control and Prevention normative data). The majority of that increase occurred within the first 6 months of exposure to risperidone tablets. The average percentiles at baseline and 12 months, respectively, were 49 and 60 for weight, 48 and 53 for height,

and 50 and 62 for body mass index.

In one 3-week, placebo-controlled trial in children and adolescent patients with acute manic or mixed episodes of bipolar I disorder, increases in body weight were higher in the risperidone tablets groups than the placebo group, but not dose related (1.90 kg in the risperidone tablets 0.5–2.5 mg group, 1.44 kg in the risperidone tablets 3–6 mg group, and 0.65 kg in the placebo group). A similar trend was observed in the mean change from baseline in body mass index.

When treating pediatric patients with risperidone tablets for any indication, weight gain should be assessed against that expected with normal growth.

## **5.6 Hyperprolactinemia**

As with other drugs that antagonize dopamine D<sub>2</sub> receptors, risperidone tablets elevates prolactin levels and the elevation persists during chronic administration. Risperidone tablets are associated with higher levels of prolactin elevation than other antipsychotic agents.

Hyperprolactinemia may suppress hypothalamic GnRH, resulting in reduced pituitary gonadotropin secretion. This, in turn, may inhibit reproductive function by impairing gonadal steroidogenesis in both female and male patients. Galactorrhea, amenorrhea, gynecomastia, and impotence have been reported in patients receiving prolactin-elevating compounds. Long-standing hyperprolactinemia when associated with hypogonadism may lead to decreased bone density in both female and male subjects.

Tissue culture experiments indicate that approximately one-third of human breast cancers are prolactin dependent *in vitro*, a factor of potential importance if the prescription of these drugs is contemplated in a patient with previously detected breast cancer. An increase in pituitary gland, mammary gland, and pancreatic islet cell neoplasia (mammary adenocarcinomas, pituitary and pancreatic adenomas) was observed in the risperidone carcinogenicity studies conducted in mice and rats [see *Nonclinical Toxicology (13.1)*]. Neither clinical studies nor epidemiologic studies conducted to date have shown an association between chronic administration of this class of drugs and tumorigenesis in humans; the available evidence is considered too limited to be conclusive at this time.

## **5.7 Orthostatic Hypotension**

Risperidone tablets may induce orthostatic hypotension associated with dizziness, tachycardia, and in some patients, syncope, especially during the initial dose-titration period, probably reflecting its alpha-adrenergic antagonistic properties. Syncope was reported in 0.2% (6/2607) of risperidone tablets-treated patients in Phase 2 and 3 studies in adults with schizophrenia. The risk of orthostatic hypotension and syncope may be minimized by limiting the initial dose to 2 mg total (either once daily or 1 mg twice daily) in normal adults and 0.5 mg twice daily in the elderly and patients with renal or hepatic impairment [see *Dosage and Administration (2.1, 2.4)*]. Monitoring of orthostatic vital signs should be considered in patients for whom this is of concern. A dose reduction should be considered if hypotension occurs. Risperidone tablets should be used with particular caution in patients with known cardiovascular disease (history of myocardial infarction or ischemia, heart failure, or conduction abnormalities), cerebrovascular disease, and conditions which would predispose patients to hypotension, e.g., dehydration and hypovolemia. Clinically significant hypotension has

been observed with concomitant use of risperidone tablets and antihypertensive medication.

### **5.8 Leukopenia, Neutropenia, and Agranulocytosis**

*Class Effect:* In clinical trial and/or postmarketing experience, events of leukopenia/neutropenia have been reported temporally related to antipsychotic agents, including risperidone tablets. Agranulocytosis has also been reported.

Possible risk factors for leukopenia/neutropenia include pre-existing low white blood cell count (WBC) and history of drug-induced leukopenia/neutropenia. Patients with a history of a clinically significant low WBC or a drug-induced leukopenia/neutropenia should have their complete blood count (CBC) monitored frequently during the first few months of therapy and discontinuation of risperidone tablets should be considered at the first sign of a clinically significant decline in WBC in the absence of other causative factors.

Patients with clinically significant neutropenia should be carefully monitored for fever or other symptoms or signs of infection and treated promptly if such symptoms or signs occur. Patients with severe neutropenia (absolute neutrophil count  $<1000/\text{mm}^3$ ) should discontinue risperidone tablets and have their WBC followed until recovery.

### **5.9 Potential for Cognitive and Motor Impairment**

Somnolence was a commonly reported adverse reactions associated with risperidone tablets treatment, especially when ascertained by direct questioning of patients. This adverse reaction is dose-related, and in a study utilizing a checklist to detect adverse events, 41% of the high-dose patients (risperidone tablets 16 mg/day) reported somnolence compared to 16% of placebo patients. Direct questioning is more sensitive for detecting adverse events than spontaneous reporting, by which 8% of risperidone tablets 16 mg/day patients and 1% of placebo patients reported somnolence as an adverse reaction. Since risperidone tablets have the potential to impair judgment, thinking, or motor skills, patients should be cautioned about operating hazardous machinery, including automobiles, until they are reasonably certain that risperidone tablets therapy does not affect them adversely.

### **5.10 Seizures**

During premarketing testing in adult patients with schizophrenia, seizures occurred in 0.3% (9/2607) of risperidone tablets-treated patients, two in association with hyponatremia. Risperidone tablets should be used cautiously in patients with a history of seizures.

### **5.11 Dysphagia**

Esophageal dysmotility and aspiration have been associated with antipsychotic drug use. Aspiration pneumonia is a common cause of morbidity and mortality in patients with advanced Alzheimer's dementia. Risperidone tablets and other antipsychotic drugs should be used cautiously in patients at risk for aspiration pneumonia. *[see Boxed Warning and Warnings and Precautions (5.1)]*

### **5.12 Priapism**

Priapism has been reported during postmarketing surveillance. Severe priapism may



require surgical intervention.

### 5.13 Body Temperature Regulation

Disruption of body temperature regulation has been attributed to antipsychotic agents. Both hyperthermia and hypothermia have been reported in association with oral risperidone tablets use. Caution is advised when prescribing for patients who will be exposed to temperature extremes.

## 6 ADVERSE REACTIONS

The following are discussed in more detail in other sections of the labeling:

- Increased mortality in elderly patients with dementia-related psychosis [*see Boxed Warning and Warnings and Precautions (5.1)*]
- Cerebrovascular adverse events, including stroke, in elderly patients with dementia-related psychosis [*see Warnings and Precautions (5.2)*]
- Neuroleptic malignant syndrome [*see Warnings and Precautions (5.3)*]
- Tardive dyskinesia [*see Warnings and Precautions (5.4)*]
- Metabolic Changes (Hyperglycemia and diabetes mellitus, Dyslipidemia, and Weight Gain) [*see Warnings and Precautions (5.5)*]
- Hyperprolactinemia [*see Warnings and Precautions (5.6)*]
- Orthostatic hypotension [*see Warnings and Precautions (5.7)*]
- Leukopenia, neutropenia, and agranulocytosis [*see Warnings and Precautions (5.8)*]
- Potential for cognitive and motor impairment [*see Warnings and Precautions (5.9)*]
- Seizures [*see Warnings and Precautions (5.10)*]
- Dysphagia [*see Warnings and Precautions (5.11)*]
- Priapism [*see Warnings and Precautions (5.12)*]
- Disruption of body temperature regulation [*see Warnings and Precautions (5.13)*]

The most common adverse reactions in clinical trials (>5% and twice placebo) were parkinsonism, akathisia, dystonia, tremor, sedation, dizziness, anxiety, blurred vision, nausea, vomiting, upper abdominal pain, stomach discomfort, dyspepsia, diarrhea, salivary hypersecretion, constipation, dry mouth, increased appetite, increased weight, fatigue, rash, nasal congestion, upper respiratory tract infection, nasopharyngitis, and pharyngolaryngeal pain.

The most common adverse reactions that were associated with discontinuation from clinical trials (causing discontinuation in >1% of adults and/or >2% of pediatrics) were nausea, somnolence, sedation, vomiting, dizziness, and akathisia [*see Adverse Reactions, Discontinuations Due to Adverse Reactions (6.1)*].

The data described in this section are derived from a clinical trial database consisting of 9803 adult and pediatric patients exposed to one or more doses of risperidone tablets for the treatment of schizophrenia, bipolar mania, autistic disorder, and other psychiatric disorders in pediatrics and elderly patients with dementia. Of these 9803 patients, 2687 were patients who received risperidone tablets while participating in double-blind, placebo-controlled trials. The conditions and duration of treatment with risperidone tablets varied greatly and included (in overlapping categories) double-blind, fixed- and flexible-dose, placebo- or active-controlled studies and open-label phases of studies, inpatients and outpatients, and short-term (up to 12 weeks) and longer-term

(up to 3 years) exposures. Safety was assessed by collecting adverse events and performing physical examinations, vital signs, body weights, laboratory analyses, and ECGs.

## 6.1 Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in clinical practice.

### Commonly-Observed Adverse Reactions in Double-Blind, Placebo-Controlled Clinical Trials – Schizophrenia

#### *Adult Patients with Schizophrenia*

Table 8 lists the adverse reactions reported in 2% or more of risperidone tablets-treated adult patients with schizophrenia in three 4- to 8-week, double-blind, placebo-controlled trials.

Table 8. Adverse Reactions in  $\geq 2\%$  of Risperidone Tablets-Treated Adult Patients (and greater than placebo) with Schizophrenia in Double-Blind, Placebo-Controlled Trials

System/Organ Class Adverse Reaction	Percentage of Patients Reporting Reaction		
	Risperidone Tablets		Placebo (N=225)
	2-8 mg per day (N=366)	>8-16 mg per day (N=198)	
<b>Cardiac Disorders</b>			
Tachycardia	1	3	0
<b>Eye Disorders</b>			
Vision blurred	3	1	1
<b>Gastrointestinal Disorders</b>			
Nausea	9	4	4
Constipation	8	9	6
Dyspepsia	8	6	5
Dry mouth	4	0	1
Abdominal discomfort	3	1	1
Salivary hypersecretion	2	1	<1
Diarrhea	2	1	1
<b>General Disorders</b>			
Fatigue	3	1	0
Chest pain	2	2	1
Asthenia	2	1	<1
<b>Infections and Infestations</b>			
Nasopharyngitis	3	4	3
Upper respiratory tract infection	2	3	1
Sinusitis	1	2	1
Urinary tract infection	1	3	0
<b>Investigations</b>			

Blood creatine phosphokinase increased	1	2	<1
Heart rate increased	<1	2	0
<b>Musculoskeletal and Connective Tissue Disorders</b>			
Back pain	4	1	1
Arthralgia	2	3	<1
Pain in extremity	2	1	1
<b>Nervous System Disorders</b>			
Parkinsonism*	14	17	8
Akathisia*	10	10	3
Sedation	10	5	2
Dizziness	7	4	2
Dystonia*	3	4	2
Tremor*	2	3	1
Dizziness postural	2	0	0
<b>Psychiatric Disorders</b>			
Insomnia	32	25	27
Anxiety	16	11	11
<b>Respiratory, Thoracic and Mediastinal Disorders</b>			
Nasal congestion	4	6	2
Dyspnea	1	2	0
Epistaxis	<1	2	0
<b>Skin and Subcutaneous Tissue Disorders</b>			
Rash	1	4	1
Dry skin	1	3	0
<b>Vascular Disorders</b>			
Orthostatic hypotension	2	1	0

\*Parkinsonism includes extrapyramidal disorder, musculoskeletal stiffness, parkinsonism, cogwheel rigidity, akinesia, bradykinesia, hypokinesia, masked facies, muscle rigidity, and Parkinson's disease. Akathisia includes akathisia and restlessness. Dystonia includes dystonia, muscle spasms, muscle contractions involuntary, muscle contracture, oculogyration, tongue paralysis. Tremor includes tremor and parkinsonian rest tremor.

### *Pediatric Patients with Schizophrenia*

Table 9 lists the adverse reactions reported in 5% or more of risperidone tablets-treated pediatric patients with schizophrenia in a 6-week double-blind, placebo-controlled trial.

Table 9. Adverse Reactions in  $\geq 5\%$  of Risperidone Tablets-Treated Pediatric Patients (and greater than placebo) with Schizophrenia in a Double-Blind Trial

System/Organ Class	Percentage of Patients Reporting Reaction		
	Risperidone Tablets		Placebo (N=54)
	1-3 mg per day (N=55)	4-6 mg per day (N=51)	

Adverse Reaction			
<b>Gastrointestinal Disorders</b>			
Salivary hypersecretion	0	10	2
<b>Nervous System Disorders</b>			
Sedation	24	12	4
Parkinsonism*	16	28	11
Tremor	11	10	6
Akathisia*	9	10	4
Dizziness	7	14	2
Dystonia*	2	6	0
<b>Psychiatric Disorders</b>			
Anxiety	7	6	0

\*Parkinsonism includes extrapyramidal disorder, muscle rigidity, musculoskeletal stiffness, and hypokinesia. Akathisia includes akathisia and restlessness. Dystonia includes dystonia and oculogyration.

### Commonly-Observed Adverse Reactions in Double-Blind, Placebo-Controlled Clinical Trials – Bipolar Mania

#### *Adult Patients with Bipolar Mania*

Table 10 lists the adverse reactions reported in 2% or more of risperidone tablets-treated adult patients with bipolar mania in four 3-week, double-blind, placebo-controlled monotherapy trials.

Table 10. Adverse Reactions in  $\geq 2\%$  of Risperidone Tablets-Treated Adult Patients (and greater than placebo) with Bipolar Mania in Double-Blind, Placebo-Controlled Monotherapy Trials

System/Organ Class Adverse Reaction	Percentage of Patients Reporting Reaction	
	Risperidone Tablets 1-6 mg per day (N=448)	Placebo (N=424)
<b>Eye Disorders</b>		
Vision blurred	2	1
<b>Gastrointestinal Disorders</b>		
Nausea	5	2
Diarrhea	3	2
Salivary hypersecretion	3	1
Stomach discomfort	2	<1
<b>General Disorders</b>		
Fatigue	2	1
<b>Nervous System Disorders</b>		
Parkinsonism*	25	9
Sedation	11	4
Akathisia*	9	3
Tremor*	6	3
Dizziness	6	5
Dystonia*	5	1

Lethargy	2	1
----------	---	---

\*Parkinsonism includes extrapyramidal disorder, parkinsonism, musculoskeletal stiffness, hypokinesia, muscle rigidity, muscle tightness, bradykinesia, cogwheel rigidity. Akathisia includes akathisia and restlessness. Tremor includes tremor and parkinsonian rest tremor. Dystonia includes dystonia, muscle spasms, oculogyration, torticollis.

Table 11 lists the adverse reactions reported in 2% or more of risperidone tablets-treated adult patients with bipolar mania in two 3-week, double-blind, placebo-controlled adjunctive therapy trials.

Table 11. Adverse Reactions in  $\geq 2\%$  of Risperidone Tablets-Treated Adult Patients (and greater than placebo) with Bipolar Mania in Double-Blind, Placebo-Controlled Adjunctive Therapy Trials

System/Organ Class Adverse Reaction	Percentage of Patients Reporting Reaction	
	Risperidone Tablets + Mood Stabilizer (N=127)	Placebo + Mood Stabilizer (N=126)
<b>Cardiac Disorders</b>		
Palpitations	2	0
<b>Gastrointestinal Disorders</b>		
Dyspepsia	9	8
Nausea	6	4
Diarrhea	6	4
Salivary hypersecretion	2	0
<b>General Disorders</b>		
Chest pain	2	1
<b>Infections and Infestations</b>		
Urinary tract infection	2	1
<b>Nervous System Disorders</b>		
Parkinsonism*	14	4
Sedation	9	4
Akathisia*	8	0
Dizziness	7	2
Tremor	6	2
Lethargy	2	1
<b>Psychiatric Disorders</b>		
Anxiety	3	2
<b>Respiratory, Thoracic and Mediastinal Disorders</b>		
Pharyngolaryngeal pain	5	2
Cough	2	0

\*Parkinsonism includes extrapyramidal disorder, hypokinesia and bradykinesia. Akathisia includes hyperkinesia and akathisia.

#### *Pediatric Patients with Bipolar Mania*

Table 12 lists the adverse reactions reported in 5% or more of risperidone tablets-treated pediatric patients with bipolar mania in a 3-week double-blind, placebo-controlled

trial.

Table 12. Adverse Reactions in  $\geq 5\%$  of Risperidone Tablets-Treated Pediatric Patients (and greater than placebo) with Bipolar Mania in Double-Blind, Placebo-Controlled Trials

System/Organ Class Adverse Reaction	Percentage of Patients Reporting Reaction		
	Risperidone Tablets		Placebo (N=58)
	0.5-2.5 mg per day (N=50)	3-6 mg per day (N=61)	
<b>Eye Disorders</b>			
Vision blurred	4	7	0
<b>Gastrointestinal Disorders</b>			
Abdominal pain upper	16	13	5
Nausea	16	13	7
Vomiting	10	10	5
Diarrhea	8	7	2
Dyspepsia	10	3	2
Stomach discomfort	6	0	2
<b>General Disorders</b>			
Fatigue	18	30	3
<b>Metabolism and Nutrition Disorders</b>			
Increased appetite	4	7	2
<b>Nervous System Disorders</b>			
Sedation	42	56	19
Dizziness	16	13	5
Parkinsonism*	6	12	3
Dystonia*	6	5	0
Akathisia*	0	8	2
<b>Psychiatric Disorders</b>			
Anxiety	0	8	3
<b>Respiratory, Thoracic and Mediastinal Disorders</b>			
Pharyngolaryngeal pain	10	3	5
<b>Skin and Subcutaneous Tissue Disorders</b>			
Rash	0	7	2

\*Parkinsonism includes musculoskeletal stiffness, extrapyramidal disorder, bradykinesia, and nuchal rigidity. Dystonia includes dystonia, laryngospasm, and muscle spasms. Akathisia includes restlessness and akathisia.

### Commonly-Observed Adverse Reactions in Double-Blind, Placebo-Controlled Clinical Trials - Autistic Disorder

Table 13 lists the adverse reactions reported in 5% or more of risperidone tablets-treated pediatric patients treated for irritability associated with autistic disorder in two 8-week, double-blind, placebo-controlled trials and one 6-week double-blind, placebo-controlled study.

Table 13. Adverse Reactions in  $\geq 5\%$  of Risperidone Tablets-Treated Pediatric Patients (and greater than placebo) Treated for Irritability Associated with Autistic Disorder in Double-Blind, Placebo-Controlled Trials

System/Organ Class Adverse Reaction	Percentage of Patients Reporting Reaction	
	Risperidone Tablets 0.5-4.0 mg per day (N=107)	Placebo (N=115)
<b>Gastrointestinal Disorders</b>		
Vomiting	20	17
Constipation	17	6
Dry mouth	10	4
Nausea	8	5
Salivary hypersecretion	7	1
<b>General Disorders and Administration Site Conditions</b>		
Fatigue	31	9
Pyrexia	16	13
Thirst	7	4
<b>Infections and Infestations</b>		
Nasopharyngitis	19	9
Rhinitis	9	7
Upper respiratory tract infection	8	3
<b>Investigations</b>		
Weight increased	8	2
<b>Metabolism and Nutrition Disorders</b>		
Increased appetite	44	15
<b>Nervous System Disorders</b>		
Sedation	63	15
Drooling	12	4
Headache	12	10
Tremor	8	1
Dizziness	8	2
Parkinsonism*	8	1
<b>Renal and Urinary Disorders</b>		
Enuresis	16	10
<b>Respiratory, Thoracic and Mediastinal Disorders</b>		
Cough	17	12
Rhinorrhea	12	10
Nasal congestion	10	4
<b>Skin and Subcutaneous Tissue Disorders</b>		
Rash	8	5

\*Parkinsonism includes musculoskeletal stiffness, extrapyramidal disorder, muscle rigidity, cogwheel rigidity, and muscle tightness.

#### Other Adverse Reactions Observed During the Clinical Trial Evaluation of Risperidone

The following additional adverse reactions occurred across all placebo-controlled, active-

controlled, and open-label studies of risperidone tablets in adults and pediatric patients.

Blood and Lymphatic System Disorders: anemia, granulocytopenia, neutropenia

Cardiac Disorders: sinus bradycardia, sinus tachycardia, atrioventricular block first degree, bundle branch block left, bundle branch block right, atrioventricular block

Ear and Labyrinth Disorders: ear pain, tinnitus

Endocrine Disorders: hyperprolactinemia

Eye Disorders: ocular hyperemia, eye discharge, conjunctivitis, eye rolling, eyelid edema, eye swelling, eyelid margin crusting, dry eye, lacrimation increased, photophobia, glaucoma, visual acuity reduced

Gastrointestinal Disorders: dysphagia, fecaloma, fecal incontinence, gastritis, lip swelling, cheilitis, aptyalism

General Disorders: edema peripheral, thirst, gait disturbance, influenza-like illness, pitting edema, edema, chills, sluggishness, malaise, chest discomfort, face edema, discomfort, generalized edema, drug withdrawal syndrome, peripheral coldness, feeling abnormal

Immune System Disorders: drug hypersensitivity

Infections and Infestations: pneumonia, influenza, ear infection, viral infection, pharyngitis, tonsillitis, bronchitis, eye infection, localized infection, cystitis, cellulitis, otitis media, onychomycosis, acarodermatitis, bronchopneumonia, respiratory tract infection, tracheobronchitis, otitis media chronic

Investigations: body temperature increased, blood prolactin increased, alanine aminotransferase increased, electrocardiogram abnormal, eosinophil count increased, white blood cell count decreased, blood glucose increased, hemoglobin decreased, hematocrit decreased, body temperature decreased, blood pressure decreased, transaminases increased

Metabolism and Nutrition Disorders: decreased appetite, polydipsia, anorexia

Musculoskeletal and Connective Tissue Disorders: joint stiffness, joint swelling, musculoskeletal chest pain, posture abnormal, myalgia, neck pain, muscular weakness, rhabdomyolysis

Nervous System Disorders: balance disorder, disturbance in attention, dysarthria, unresponsive to stimuli, depressed level of consciousness, movement disorder, transient ischemic attack, coordination abnormal, cerebrovascular accident, speech disorder, syncope, loss of consciousness, hypoesthesia, tardive dyskinesia, dyskinesia, cerebral ischemia, cerebrovascular disorder, neuroleptic malignant syndrome, diabetic coma, head titubation

Psychiatric Disorders: agitation, blunted affect, confusional state, middle insomnia, nervousness, sleep disorder, listlessness, libido decreased, and anorgasmia

Renal and Urinary Disorders: enuresis, dysuria, pollakiuria, urinary incontinence

Reproductive System and Breast Disorders: menstruation irregular, amenorrhea, gynecomastia, galactorrhea, vaginal discharge, menstrual disorder, erectile dysfunction, retrograde ejaculation, ejaculation disorder, sexual dysfunction, breast enlargement

Respiratory, Thoracic, and Mediastinal Disorders: wheezing, pneumonia aspiration, sinus



congestion, dysphonia, productive cough, pulmonary congestion, respiratory tract congestion, rales, respiratory disorder, hyperventilation, nasal edema

Skin and Subcutaneous Tissue Disorders: erythema, skin discoloration, skin lesion, pruritus, skin disorder, rash erythematous, rash papular, rash generalized, rash maculopapular, acne, hyperkeratosis, seborrheic dermatitis

Vascular Disorders: hypotension, flushing

#### Discontinuations Due to Adverse Reactions

##### *Schizophrenia - Adults*

Approximately 7% (39/564) of risperidone tablets-treated patients in double-blind, placebo-controlled trials discontinued treatment due to an adverse reaction, compared with 4% (10/225) who were receiving placebo. The adverse reactions associated with discontinuation in 2 or more risperidone tablets-treated patients were:

Table 14. Adverse Reactions Associated With Discontinuation in 2 or More Risperidone Tablets-Treated Adult Patients in Schizophrenia Trials

Adverse Reaction	Risperidone Tablets		Placebo (N=225)
	2-8 mg/day (N=366)	>8-16 mg/day (N=198)	
Dizziness	1.4%	1.0%	0%
Nausea	1.4%	0%	0%
Vomiting	0.8%	0%	0%
Parkinsonism	0.8%	0%	0%
Somnolence	0.8%	0%	0%
Dystonia	0.5%	0%	0%
Agitation	0.5%	0%	0%
Abdominal pain	0.5%	0%	0%
Orthostatic hypotension	0.3%	0.5%	0%
Akathisia	0.3%	2.0%	0%

Discontinuation for extrapyramidal symptoms (including Parkinsonism, akathisia, dystonia, and tardive dyskinesia) was 1% in placebo-treated patients, and 3.4% in active control-treated patients in a double-blind, placebo- and active-controlled trial.

##### *Schizophrenia - Pediatrics*

Approximately 7% (7/106), of risperidone tablets-treated patients discontinued treatment due to an adverse reaction in a double-blind, placebo-controlled trial, compared with 4% (2/54) placebo-treated patients. The adverse reactions associated with discontinuation for at least one risperidone tablets-treated patient were dizziness (2%), somnolence (1%), sedation (1%), lethargy (1%), anxiety (1%), balance disorder (1%), hypotension (1%), and palpitation (1%).

##### *Bipolar Mania - Adults*

In double-blind, placebo-controlled trials with risperidone tablets as monotherapy, approximately 6% (25/448) of risperidone tablets-treated patients discontinued treatment due to an adverse event, compared with approximately 5% (19/424) of placebo-treated patients. The adverse reactions associated with discontinuation in risperidone tablets-treated patients were:

Table 15. Adverse Reactions Associated With Discontinuation in 2 or More Risperidone Tablets-Treated Adult Patients in Bipolar Mania Clinical Trials

<b>Adverse Reaction</b>	<b>Risperidone Tablets 1-6 mg/day (N=448)</b>	<b>Placebo (N=448)</b>
Parkinsonism	0.4%	0%
Lethargy	0.2%	0%
Dizziness	0.2%	0%
Alanine aminotransferase increased	0.2%	0.2%
Aspartate aminotransferase increased	0.2%	0.2%

*Bipolar Mania – Pediatrics*

In a double-blind, placebo-controlled trial 12% (13/111) of risperidone tablets-treated patients discontinued due to an adverse reaction, compared with 7% (4/58) of placebo-treated patients. The adverse reactions associated with discontinuation in more than one risperidone tablets-treated pediatric patient were nausea (3%), somnolence (2%), sedation (2%), and vomiting (2%).

*Autistic Disorder – Pediatrics*

In the two 8-week, placebo-controlled trials in pediatric patients treated for irritability associated with autistic disorder (n = 156), one risperidone tablets-treated patient discontinued due to an adverse reaction (Parkinsonism), and one placebo-treated patient discontinued due to an adverse event.

Dose Dependency of Adverse Reactions in Clinical Trials

*Extrapyramidal Symptoms*

Data from two fixed-dose trials in adults with schizophrenia provided evidence of dose-relatedness for extrapyramidal symptoms associated with risperidone tablets treatment.

Two methods were used to measure extrapyramidal symptoms (EPS) in an 8-week trial comparing 4 fixed doses of risperidone tablets (2, 6, 10, and 16 mg/day), including (1) a Parkinsonism score (mean change from baseline) from the Extrapyramidal Symptom Rating Scale, and (2) incidence of spontaneous complaints of EPS:

Table 16.

<b>Dose Groups</b>	<b>Placebo</b>	<b>Risperidone Tablets 2 mg</b>	<b>Risperidone Tablets 6 mg</b>	<b>Risperidone Tablets 10 mg</b>	<b>Risperidone Tablets 16 mg</b>
Parkinsonism	1.2	0.9	1.8	2.4	2.6
EPS Incidence	13%	17%	21%	21%	35%

Similar methods were used to measure extrapyramidal symptoms (EPS) in an 8-week trial comparing 5 fixed doses of risperidone tablets (1, 4, 8, 12, and 16 mg/day):

Table 17.

<b>Dose Groups</b>	<b>Risperidone Tablets 1 mg</b>	<b>Risperidone Tablets 4 mg</b>	<b>Risperidone Tablets 8 mg</b>	<b>Risperidone Tablets 12 mg</b>	<b>Risperidone Tablets 16 mg</b>
Parkinsonism	0.6	1.7	2.4	2.9	4.1
EPS Incidence	7%	12%	17%	18%	20%

### *Dystonia*

*Class Effect:* Symptoms of dystonia, prolonged abnormal contractions of muscle groups, may occur in susceptible individuals during the first few days of treatment. Dystonic symptoms include: spasm of the neck muscles, sometimes progressing to tightness of the throat, swallowing difficulty, difficulty breathing, and/or protrusion of the tongue. While these symptoms can occur at low doses, they occur more frequently and with greater severity with high potency and at higher doses of first generation antipsychotic drugs. An elevated risk of acute dystonia is observed in males and younger age groups.

### *Other Adverse Reactions*

Adverse event data elicited by a checklist for side effects from a large study comparing 5 fixed doses of risperidone tablets (1, 4, 8, 12, and 16 mg/day) were explored for dose-relatedness of adverse events. A Cochran-Armitage Test for trend in these data revealed a positive trend ( $p < 0.05$ ) for the following adverse reactions: somnolence, vision abnormal, dizziness, palpitations, weight increase, erectile dysfunction, ejaculation disorder, sexual function abnormal, fatigue, and skin discoloration.

### Changes in Body Weight

Weight gain was observed in short-term, controlled trials and longer-term uncontrolled studies in adult and pediatric patients [see *Warnings and Precautions (5.5)*, *Adverse Reactions (6)*, and *Use in Specific Populations (8.4)*].

### Changes in ECG Parameters

Between-group comparisons for pooled placebo-controlled trials in adults revealed no statistically significant differences between risperidone and placebo in mean changes from baseline in ECG parameters, including QT, QTc, and PR intervals, and heart rate. When all risperidone tablets doses were pooled from randomized controlled trials in several indications, there was a mean increase in heart rate of 1 beat per minute compared to no change for placebo patients. In short-term schizophrenia trials, higher doses of risperidone (8-16 mg/day) were associated with a higher mean increase in heart rate compared to placebo (4-6 beats per minute). In pooled placebo-controlled acute mania trials in adults, there were small decreases in mean heart rate, similar among all treatment groups.

In the two placebo-controlled trials in children and adolescents with autistic disorder (aged 5 - 16 years) mean changes in heart rate were an increase of 8.4 beats per minute in the risperidone tablets groups and 6.5 beats per minute in the placebo group. There were no other notable ECG changes.

In a placebo-controlled acute mania trial in children and adolescents (aged 10 - 17 years), there were no significant changes in ECG parameters, other than the effect of risperidone tablets to transiently increase pulse rate ( $< 6$  beats per minute). In two controlled schizophrenia trials in adolescents (aged 13 - 17 years), there were no clinically meaningful changes in ECG parameters including corrected QT intervals

between treatment groups or within treatment groups over time.

## 6.2 Postmarketing Experience

The following adverse reactions have been identified during postapproval use of risperidone. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency establish a causal relationship to drug exposure. These adverse reactions include: alopecia, anaphylactic reaction, angioedema, atrial fibrillation, cardiopulmonary arrest, diabetic ketoacidosis in patients with impaired glucose metabolism, dysgeusia, hypoglycemia, hypothermia, ileus, inappropriate antidiuretic hormone secretion, intestinal obstruction, jaundice, mania, pancreatitis, pituitary adenoma, precocious puberty, pulmonary embolism, QT prolongation, sleep apnea syndrome, sudden death, thrombocytopenia, thrombotic thrombocytopenic purpura, urinary retention and water intoxication.

## 7 DRUG INTERACTIONS

### 7.1 Pharmacokinetic-related Interactions

The dose of risperidone tablets should be adjusted when used in combination with CYP2D6 enzyme inhibitors (e.g., fluoxetine, and paroxetine) and enzyme inducers (e.g., carbamazepine) [see Table 18 and Dosage and Administration (2.5)]. Dose adjustment is not recommended for risperidone tablets when co-administered with ranitidine, cimetidine, amitriptyline, or erythromycin [see Table 18 ].

Table 18. Summary of Effect of Coadministered Drugs on Exposure to Active Moiety (Risperidone + 9-Hydroxy-Risperidone) in Healthy Subjects or Patients with Schizophrenia

Coadministered Drug	Dosing Schedule		Effect on Active Moiety (Risperidone + 9-Hydroxy-Risperidone (Ratio*))		Risperidone Dose Recommendation
	Coadministered Drug	Risperidone	AUC	Cmax	
Enzyme (CYP2D6) inhibitors					
Fluoxetine	20 mg/day	2 or 3 mg twice daily	1.4	1.5	Re-evaluate dosing. Do not exceed 8 mg/day
Paroxetine	10 mg/day	4 mg/day	1.3	-	Re-evaluate dosing. Do not exceed 8 mg/day
	20 mg/day	4 mg/day	1.6	-	
	40 mg/day	4 mg/day	1.8	-	
Enzyme (CYP3A/ PgP)					

Inducers)					
Inducers					
Carbamazepine	573 ± 168 mg/day	3 mg twice daily	0.51	0.55	Titrate dose upwards. Do not exceed twice the patient's usual dose
Enzyme (CYP3A) inhibitors					
Ranitidine	150 mg twice daily	1 mg single dose	1.2	1.4	Dose adjustment not needed
Cimetidine	400 mg twice daily	1 mg single dose	1.1	1.3	Dose adjustment not needed
Erythromycin	500 mg four times daily	1 mg single dose	1.1	0.94	Dose adjustment not needed
Other Drugs					
Amitriptyline	50 mg twice daily	3 mg twice daily	1.2	1.1	Dose adjustment not Needed

\*Change relative to reference

## Effect of Risperidone on other drugs

### *Lithium*

Repeated oral doses of risperidone tablets (3 mg twice daily) did not affect the exposure (AUC) or peak plasma concentrations ( $C_{max}$ ) of lithium (n=13). Dose adjustment for lithium is not recommended.

### *Valproate*

Repeated oral doses of risperidone tablets (4 mg once daily) did not affect the pre-dose or average plasma concentrations and exposure (AUC) of valproate (1000 mg/day in three divided doses) compared to placebo (n=21). However, there was a 20% increase in valproate peak plasma concentration ( $C_{max}$ ) after concomitant administration of risperidone tablets. Dose adjustment for valproate is not recommended.

### *Digoxin*

Risperidone tablets (0.25 mg twice daily) did not show a clinically relevant effect on the pharmacokinetics of digoxin. Dose adjustment for digoxin is not recommended.

## **7.2 Pharmacodynamic-related Interactions**

### Centrally-Acting Drugs and Alcohol

Given the primary CNS effects of risperidone, caution should be used when risperidone tablets are taken in combination with other centrally-acting drugs and alcohol.

### Drugs with Hypotensive Effects

Because of its potential for inducing hypotension, risperidone tablets may enhance the

hypotensive effects of other therapeutic agents with this potential.

### Levodopa and Dopamine Agonists

Risperidone tablets may antagonize the effects of levodopa and dopamine agonists.

### Clozapine

Chronic administration of clozapine with risperidone tablets may decrease the clearance of risperidone.

## **8 USE IN SPECIFIC POPULATIONS**

### **8.1 Pregnancy**

#### Pregnancy Category C

##### *Risk Summary*

Adequate and well controlled studies with risperidone tablets have not been conducted in pregnant women. Neonates exposed to antipsychotic drugs (including risperidone tablets) during the third trimester of pregnancy are at risk for extrapyramidal and/or withdrawal symptoms following delivery. There was no increase in the incidence of malformations in embryo-fetal studies in rats and rabbits at 0.4–6 times MHRD. Increased pup mortality was noted at all doses in peri-postnatal studies in rats. Risperidone tablets should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

##### *Clinical Considerations*

#### Fetal/Neonatal Adverse Reactions

Monitor neonates exhibiting extrapyramidal or withdrawal symptoms. Some neonates recover within hours or days without specific treatment; others may require prolonged hospitalization.

##### *Data*

#### Human Data

There have been reports of agitation, hypertonia, hypotonia, tremor, somnolence, respiratory distress, and feeding disorder in neonates following in utero exposure to antipsychotics in the third trimester. These complications have varied in severity; while in some cases symptoms have been self-limited, in other cases neonates have required intensive care unit support and prolonged hospitalization.

There was one report of a case of agenesis of the corpus callosum in an infant exposed to risperidone in utero. The causal relationship to risperidone tablets therapy is unknown.

#### Animal Data

The teratogenic potential of risperidone was studied in three Segment II studies in Sprague-Dawley and Wistar rats (0.63-10 mg/kg or 0.4 to 6 times the maximum recommended human dose [MRHD] on a mg/m<sup>2</sup> body surface area basis) and in one Segment II study in New Zealand rabbits (0.31-5 mg/kg or 0.4 to 6 times the MRHD on a mg/m<sup>2</sup> body surface area basis). There were no teratogenic effects in offspring of rats

or rabbits given 0.4 to 6 times the MRHD on a mg/m<sup>2</sup> body surface area basis. In three reproductive studies in rats (two Segment III and a multigenerational study), there was an increase in pup deaths during the first 4 days of lactation at doses of 0.16-5 mg/kg or 0.1 to 3 times the MRHD on a mg/m<sup>2</sup> body surface area basis. It is not known whether these deaths were due to a direct effect on the fetuses or pups or to effects on the dams.

There was no no-effect dose for increased rat pup mortality. In one Segment III study, there was an increase in stillborn rat pups at a dose of 2.5 mg/kg or 1.5 times the MRHD on a mg/m<sup>2</sup> body surface area basis. In a cross-fostering study in Wistar rats, toxic effects on the fetus or pups were observed, as evidenced by a decrease in the number of live pups and an increase in the number of dead pups at birth (Day 0), and a decrease in birth weight in pups of drug-treated dams. In addition, there was an increase in deaths by Day 1 among pups of drug-treated dams, regardless of whether or not the pups were cross-fostered. Risperidone also appeared to impair maternal behavior in that pup body weight gain and survival (from Day 1 to 4 of lactation) were reduced in pups born to control but reared by drug-treated dams. These effects were all noted at the one dose of risperidone tested, i.e., 5 mg/kg or 3 times the MRHD on a mg/m<sup>2</sup> body surface area basis.

Placental transfer of risperidone occurs in rat pups.

## **8.2 Labor & Delivery**

The effect of risperidone tablets on labor and delivery in humans is unknown.

## **8.3 Nursing Mothers**

Risperidone and 9-hydroxyrisperidone are present in human breast milk. Because of the potential for serious adverse reactions in nursing infants from risperidone, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother.

## **8.4 Pediatric Use**

### Approved Pediatric Indications

#### *Schizophrenia*

The efficacy and safety of risperidone tablets in the treatment of schizophrenia were demonstrated in 417 adolescents, aged 13 - 17 years, in two short-term (6 and 8 weeks, respectively) double-blind controlled trials [see *Indications and Usage (1.1)*, *Adverse Reactions (6.1)*, and *Clinical Studies (14.1)*]. Additional safety and efficacy information was also assessed in one long-term (6-month) open-label extension study in 284 of these adolescent patients with schizophrenia.

Safety and effectiveness of risperidone tablets in children less than 13 years of age with schizophrenia have not been established.

#### *Bipolar I Disorder*

The efficacy and safety of risperidone tablets in the short-term treatment of acute manic or mixed episodes associated with Bipolar I Disorder in 169 children and adolescent patients, aged 10 - 17 years, were demonstrated in one double-blind, placebo-controlled, 3-week trial [see *Indications and Usage (1.2)*, *Adverse Reactions (6.2)*, and

*Clinical Studies (14.2)].*

Safety and effectiveness of risperidone tablets in children less than 10 years of age with bipolar disorder have not been established.

### *Autistic Disorder*

The efficacy and safety of risperidone tablets in the treatment of irritability associated with autistic disorder were established in two 8-week, double-blind, placebo-controlled trials in 156 children and adolescent patients, aged 5 to 16 years [*see Indications and Usage (1.3), Adverse Reactions (6.1) and Clinical Studies (14.4)*]. Additional safety information was also assessed in a long-term study in patients with autistic disorder, or in short- and long-term studies in more than 1200 pediatric patients with psychiatric disorders other than autistic disorder, schizophrenia, or bipolar mania who were of similar age and weight, and who received similar dosages of risperidone tablets as patients treated for irritability associated with autistic disorder.

A third study was a 6-week, multicenter, randomized, double-blind, placebo-controlled, fixed-dose study to evaluate the efficacy and safety of a lower than recommended dose of risperidone in subjects 5 to 17 years of age with autistic disorder and associated irritability, and related behavioral symptoms. There were two weight-based, fixed doses of risperidone (high-dose and low-dose). The high dose was 1.25 mg per day for patients weighing 20 to < 45 kg, and it was 1.75 mg per day for patients weighing  $\geq$  45 kg. The low dose was 0.125 mg per day for patients weighing 20 to < 45 kg, and it was 0.175 mg per day for patients weighing  $\geq$  45 kg. The study demonstrated the efficacy of high-dose risperidone, but it did not demonstrate efficacy for low-dose risperidone.

### Adverse Reactions in Pediatric Patients

#### *Tardive Dyskinesia*

In clinical trials in 1885 children and adolescents treated with risperidone tablets, 2 (0.1%) patients were reported to have tardive dyskinesia, which resolved on discontinuation of risperidone tablets treatment [*see also Warnings and Precautions (5.4)*].

#### *Weight Gain*

Weight gain has been observed in children and adolescents during treatment with risperidone tablets. Clinical monitoring of weight is recommended during treatment.

Data derive from short-term placebo-controlled trials and longer-term uncontrolled studies in pediatric patients (ages 5 to 17 years) with schizophrenia, bipolar disorder, autistic disorder, or other psychiatric disorders. In the short-term trials (3 to 8 weeks), the mean weight gain for risperidone tablets-treated patients was 2 kg, compared to 0.6 kg for placebo-treated patients. In these trials, approximately 33% of the risperidone tablets group had weight gain  $\geq$  7%, compared to 7% in the placebo group. In longer-term, uncontrolled, open-label pediatric studies, the mean weight gain was 5.5 kg at Week 24 and 8 kg at Week 48 [*see Warnings and Precautions (5.5) and Adverse Reactions (6.1)*].

#### *Somnolence*

Somnolence was frequently observed in placebo-controlled clinical trials of pediatric patients with autistic disorder. Most cases were mild or moderate in severity. These events were most often of early onset with peak incidence occurring during the first two



weeks of treatment, and transient with a median duration of 16 days. Somnolence was the most commonly observed adverse reaction in the clinical trial of bipolar disorder in children and adolescents, as well as in the schizophrenia trials in adolescents. As was seen in the autistic disorder trials, these adverse reactions were most often of early onset and transient in duration [see *Adverse Reactions (6.1, 6.2)*]. Patients experiencing persistent somnolence may benefit from a change in dosing regimen [see *Dosage & Administration (2.1, 2.2, and 2.3)*].

### *Hyperprolactinemia*

Risperidone tablets have been shown to elevate prolactin levels in children and adolescents as well as in adults [see *Warnings and Precautions (5.6)*]. In double-blind, placebo-controlled studies of up to 8 weeks duration in children and adolescents (aged 5 to 17 years) with autistic disorder or psychiatric disorders other than autistic disorder, schizophrenia, or bipolar mania, 49% of patients who received risperidone tablets had elevated prolactin levels compared to 2% of patients who received placebo. Similarly, in placebo-controlled trials in children and adolescents (aged 10 to 17 years) with bipolar disorder, or adolescents (aged 13 to 17 years) with schizophrenia, 82–87% of patients who received risperidone tablets had elevated levels of prolactin compared to 3–7% of patients on placebo. Increases were dose-dependent and generally greater in females than in males across indications.

In clinical trials in 1885 children and adolescents, galactorrhea was reported in 0.8% of risperidone tablets-treated patients and gynecomastia was reported in 2.3% of risperidone tablets-treated patients.

### Growth and Sexual Maturation

The long-term effects of risperidone tablets on growth and sexual maturation have not been fully evaluated in children and adolescents.

### Juvenile Animal Studies

Juvenile dogs were treated for 40 weeks with oral risperidone doses of 0.31, 1.25, or 5 mg/kg/day. Decreased bone length and density were seen, with a no-effect dose of 0.31 mg/kg/day. This dose produced plasma levels (AUC) of risperidone plus its active metabolite paliperidone (9-hydroxy-risperidone) which were similar to those in children and adolescents receiving the maximum recommended human dose (MRHD) of 6 mg/day. In addition, a delay in sexual maturation was seen at all doses in both males and females. The above effects showed little or no reversibility in females after a 12 week drug-free recovery period.

In a study in which juvenile rats were treated with oral risperidone from days 12 to 50 of age, a reversible impairment of performance in a test of learning and memory was seen, in females only, with a no-effect dose of 0.63 mg/kg/day. This dose produced plasma levels (AUC) of risperidone plus paliperidone about half those observed in humans at the MRHD. No other consistent effects on neurobehavioral or reproductive development were seen up to the highest testable dose (1.25 mg/kg/day). This dose produced plasma levels (AUC) of risperidone plus paliperidone which were about two thirds of those observed in humans at the MRHD.

## **8.5 Geriatric Use**

Clinical studies of risperidone tablets in the treatment of schizophrenia did not include

sufficient numbers of patients aged 65 and over to determine whether or not they respond differently than younger patients. Other reported clinical experience has not identified differences in responses between elderly and younger patients. In general, a lower starting dose is recommended for an elderly patient, reflecting a decreased pharmacokinetic clearance in the elderly, as well as a greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy [see *Clinical Pharmacology (12.3) and Dosage & Administration (2.4, 2.5)*]. While elderly patients exhibit a greater tendency to orthostatic hypotension, its risk in the elderly may be minimized by limiting the initial dose to 0.5 mg twice daily followed by careful titration [see *Warnings and Precautions (5.7)*]. Monitoring of orthostatic vital signs should be considered in patients for whom this is of concern.

This drug is substantially excreted by the kidneys, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function [see *Dosage & Administration (2.4)*].

## **8.6 Renal Impairment**

In patients with moderate to severe (Cl<sub>cr</sub> 59 to 15 mL/min) renal disease, clearance of the sum of risperidone and its active metabolite decreased by 60%, compared to young healthy subjects. Risperidone tablets doses should be reduced in patients with renal disease [see *Dosage and Administration (2.4)*].

## **8.7 Hepatic Impairment**

While the pharmacokinetics of risperidone in subjects with liver disease were comparable to those in young healthy subjects, the mean free fraction of risperidone in plasma was increased by about 35% because of the diminished concentration of both albumin and  $\alpha_1$ -acid glycoprotein. Risperidone tablets doses should be reduced in patients with liver disease [see *Dosage and Administration (2.4)*].

## **8.8 Patients with Parkinsons Disease or Lewy Body Dementia**

Patients with Parkinsons Disease or Dementia with Lewy Bodies can experience increased sensitivity to risperidone tablets. Manifestations can include confusion, obtundation, postural instability with frequent falls, extrapyramidal symptoms, and clinical features consistent with neuroleptic malignant syndrome.

# **9 DRUG ABUSE AND DEPENDENCE**

## **9.1 Controlled Substance**

Risperidone tablets are not a controlled substance.

## **9.2 Abuse**

Risperidone tablets have not been systematically studied in animals or humans for its potential for abuse. While the clinical trials did not reveal any tendency for any drug-seeking behavior, these observations were not systematic and it is not possible to predict on the basis of this limited experience the extent to which a CNS-active drug will be misused, diverted, and/or abused once marketed. Consequently, patients should be

evaluated carefully for a history of drug abuse, and such patients should be observed closely for signs of risperidone tablets misuse or abuse (e.g., development of tolerance, increases in dose, drug-seeking behavior).

### **9.3 Dependence**

Risperidone tablets have not been systematically studied in animals or humans for its potential for tolerance or physical dependence.

## **10 OVERDOSAGE**

### **10.1 Human Experience**

Premarketing experience included eight reports of acute risperidone tablets overdose with estimated doses ranging from 20 to 300 mg and no fatalities. In general, reported signs and symptoms were those resulting from an exaggeration of the drug's known pharmacological effects, i.e., drowsiness and sedation, tachycardia and hypotension, and extrapyramidal symptoms. One case, involving an estimated overdose of 240 mg, was associated with hyponatremia, hypokalemia, prolonged QT, and widened QRS. Another case, involving an estimated overdose of 36 mg, was associated with a seizure.

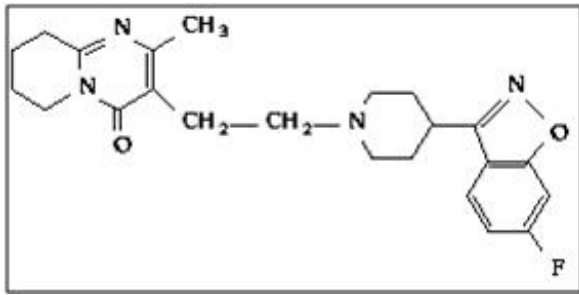
Postmarketing experience includes reports of acute risperidone tablets overdose, with estimated doses of up to 360 mg. In general, the most frequently reported signs and symptoms are those resulting from an exaggeration of the drug's known pharmacological effects, i.e., drowsiness, sedation, tachycardia, hypotension, and extrapyramidal symptoms. Other adverse reactions reported since market introduction related to risperidone tablets overdose include prolonged QT interval and convulsions. Torsade de pointes has been reported in association with combined overdose of risperidone tablets and paroxetine.

### **10.2 Management of Overdosage**

For the most up to date information on the management of risperidone tablets overdose, contact a certified poison control center (1-800-222-1222 or [www.poisson.org](http://www.poisson.org)). Provide supportive care including close medical supervision and monitoring. Treatment should consist of general measures employed in the management of overdose with any drug. Consider the possibility of multiple drug overdose. Ensure an adequate airway, oxygenation, and ventilation. Monitor cardiac rhythm and vital signs. Use supportive and symptomatic measures. There is no specific antidote to risperidone tablets.

## **11 DESCRIPTION**

Risperidone tablets USP contain risperidone USP, an atypical antipsychotic belonging to the chemical class of benzisoxazole derivatives. The chemical designation is 3-[2-[4-(6-fluoro-1,2-benzisoxazol-3-yl)-1-piperidinyl]ethyl]-6,7,8,9-tetrahydro-2-methyl-4H-pyrido[1,2-a]pyrimidin-4-one. Its molecular formula is  $C_{23}H_{27}FN_4O_2$  and its molecular weight is 410.49. The structural formula is:



Risperidone USP is a white to slightly beige powder. It is practically insoluble in water, freely soluble in methylene chloride, and soluble in methanol and 0.1 N HCl.

Risperidone tablets USP are for oral administration and available in 0.25 mg (orange), 0.5 mg (orange), 1 mg (white), 2 mg (yellow), 3 mg (orange), and 4 mg (brown) strengths. Risperidone tablets contain the following inactive ingredients: colloidal silicon dioxide, hypromellose, lactose monohydrate, magnesium stearate, microcrystalline cellulose, propylene glycol (except 1 mg), sodium lauryl sulphate, sodium starch glycolate and polyethylene glycol (1 mg). Tablets of 0.25 mg, 0.5 mg, 2 mg, 3 mg, and 4 mg also contain talc and titanium dioxide. 0.25 mg, 0.5 mg, and 3 mg tablets contain FD&C Yellow # 6 aluminum lake, the 2 mg tablets contain yellow iron oxide; the 4 mg tablets contain iron oxide red.

## 12 CLINICAL PHARMACOLOGY

### 12.1 Mechanism of Action

The mechanism of action of risperidone tablets, in schizophrenia, is unknown. However, it has been proposed that the drug's therapeutic activity in schizophrenia could be mediated through a combination of dopamine Type 2 ( $D_2$ ) and serotonin Type 2 ( $5HT_2$ ) receptor antagonism. The clinical effect from risperidone tablets results from the combined concentrations of risperidone and its major metabolite, 9-hydroxyrisperidone [see *Clinical Pharmacology (12.3)*]. Antagonism at receptors other than  $D_2$  and  $5HT_2$  [see *Clinical Pharmacology (12.1)*] may explain some of the other effects of risperidone tablets.

### 12.2 Pharmacodynamics

Risperidone tablets are a selective monoaminergic antagonist with high affinity ( $K_i$  of 0.12 to 7.3 nM) for the serotonin Type 2 ( $5HT_2$ ), dopamine Type 2 ( $D_2$ ),  $\alpha_1$  and  $\alpha_2$  adrenergic, and  $H_1$  histaminergic receptors. Risperidone tablets act as an antagonist at other receptors, but with lower potency. Risperidone tablets have low to moderate affinity ( $K_i$  of 47 to 253 nM) for the serotonin  $5HT_{1C}$ ,  $5HT_{1D}$ , and  $5HT_{1A}$  receptors, weak affinity ( $K_i$  of 620 to 800 nM) for the dopamine  $D_1$  and haloperidol-sensitive sigma site, and no affinity (when tested at concentrations  $>10^{-5}$  M) for cholinergic muscarinic or  $\beta_1$  and  $\beta_2$  adrenergic receptors.

### 12.3 Pharmacokinetics

#### Absorption

Risperidone is well absorbed. The absolute oral bioavailability of risperidone is 70%

(CV=25%). The relative oral bioavailability of risperidone from a tablet is 94% (CV=10%) when compared to a solution.

Plasma concentrations of risperidone, its major metabolite, 9-hydroxyrisperidone, and risperidone plus 9-hydroxyrisperidone are dose proportional over the dosing range of 1 to 16 mg daily (0.5 to 8 mg twice daily). Following oral administration of tablet, mean peak plasma concentrations of risperidone occurred at about 1 hour. Peak concentrations of 9-hydroxyrisperidone occurred at about 3 hours in extensive metabolizers, and 17 hours in poor metabolizers. Steady-state concentrations of risperidone are reached in 1 day in extensive metabolizers and would be expected to reach steady-state in about 5 days in poor metabolizers. Steady-state concentrations of 9-hydroxyrisperidone are reached in 5-6 days (measured in extensive metabolizers).

### *Food Effect*

Food does not affect either the rate or extent of absorption of risperidone. Thus, risperidone tablets can be given with or without meals.

### Distribution

Risperidone is rapidly distributed. The volume of distribution is 1-2 L/kg. In plasma, risperidone is bound to albumin and  $\alpha_1$ -acid glycoprotein. The plasma protein binding of risperidone is 90%, and that of its major metabolite, 9-hydroxyrisperidone, is 77%. Neither risperidone nor 9-hydroxyrisperidone displaces each other from plasma binding sites. High therapeutic concentrations of sulfamethazine (100 mcg/mL), warfarin (10 mcg/mL), and carbamazepine (10 mcg/mL) caused only a slight increase in the free fraction of risperidone at 10 ng/mL and 9-hydroxyrisperidone at 50 ng/mL, changes of unknown clinical significance.

### Metabolism

Risperidone is extensively metabolized in the liver. The main metabolic pathway is through hydroxylation of risperidone to 9-hydroxyrisperidone by the enzyme, CYP 2D6. A minor metabolic pathway is through *N*-dealkylation. The main metabolite, 9-hydroxyrisperidone, has similar pharmacological activity as risperidone. Consequently, the clinical effect of the drug results from the combined concentrations of risperidone plus 9-hydroxyrisperidone.

CYP 2D6, also called debrisoquin hydroxylase, is the enzyme responsible for metabolism of many neuroleptics, antidepressants, antiarrhythmics, and other drugs. CYP 2D6 is subject to genetic polymorphism (about 6%-8% of Caucasians, and a very low percentage of Asians, have little or no activity and are "poor metabolizers") and to inhibition by a variety of substrates and some non-substrates, notably quinidine. Extensive CYP 2D6 metabolizers convert risperidone rapidly into 9-hydroxyrisperidone, whereas poor CYP 2D6 metabolizers convert it much more slowly. Although extensive metabolizers have lower risperidone and higher 9-hydroxyrisperidone concentrations than poor metabolizers, the pharmacokinetics of risperidone and 9-hydroxyrisperidone combined, after single and multiple doses, are similar in extensive and poor metabolizers.

Risperidone could be subject to two kinds of drug-drug interactions. First, inhibitors of CYP 2D6 interfere with conversion of risperidone to 9-hydroxyrisperidone [see *Drug Interactions (7)*]. This occurs with quinidine, giving essentially all recipients a risperidone pharmacokinetic profile typical of poor metabolizers. The therapeutic benefits and

adverse effects of risperidone in patients receiving quinidine have not been evaluated, but observations in a modest number ( $n \approx 70$ ) of poor metabolizers given risperidone tablets do not suggest important differences between poor and extensive metabolizers. Second, co-administration of known enzyme inducers (e.g., carbamazepine, phenytoin, rifampin, and phenobarbital) with risperidone tablets may cause a decrease in the combined plasma concentrations of risperidone and 9-hydroxyrisperidone [see *Drug Interactions (7)*]. It would also be possible for risperidone to interfere with metabolism of other drugs metabolized by CYP 2D6. Relatively weak binding of risperidone to the enzyme suggests this is unlikely [see *Drug Interactions (7)*].

*In vitro* studies indicate that risperidone is a relatively weak inhibitor of CYP 2D6. Therefore, risperidone tablets are not expected to substantially inhibit the clearance of drugs that are metabolized by this enzymatic pathway. In drug interaction studies, risperidone tablets did not significantly affect the pharmacokinetics of donepezil and galantamine, which are metabolized by CYP 2D6.

*In vitro* studies demonstrated that drugs metabolized by other CYP isozymes, including 1A1, 1A2, 2C9, 2C19, and 3A4, are only weak inhibitors of risperidone metabolism.

### Excretion

Risperidone and its metabolites are eliminated via the urine and, to a much lesser extent, via the feces. As illustrated by a mass balance study of a single 1 mg oral dose of <sup>14</sup>C-risperidone administered as solution to three healthy male volunteers, total recovery of radioactivity at 1 week was 84%, including 70% in the urine and 14% in the feces.

The apparent half-life of risperidone was 3 hours (CV=30%) in extensive metabolizers and 20 hours (CV=40%) in poor metabolizers. The apparent half-life of 9-hydroxyrisperidone was about 21 hours (CV=20%) in extensive metabolizers and 30 hours (CV=25%) in poor metabolizers. The pharmacokinetics of risperidone and 9-hydroxyrisperidone combined, after single and multiple doses, were similar in extensive and poor metabolizers, with an overall mean elimination half-life of about 20 hours.

### Drug-Drug Interaction Studies

[See *Drug Interactions (7)*].

### Specific Populations

#### *Renal and Hepatic Impairment*

[See *Use in Specific Populations (8.6 and 8.7)*].

#### *Elderly*

In healthy elderly subjects, renal clearance of both risperidone and 9-hydroxyrisperidone was decreased, and elimination half-lives were prolonged compared to young healthy subjects. Dosing should be modified accordingly in the elderly patients [see *Use in Specific Populations (8.5)*].

#### *Pediatric*

The pharmacokinetics of risperidone and 9-hydroxyrisperidone in children were similar to those in adults after correcting for the difference in body weight.

#### *Race and Gender Effects*

No specific pharmacokinetic study was conducted to investigate race and gender

effects, but a population pharmacokinetic analysis did not identify important differences in the disposition of risperidone due to gender (whether corrected for body weight or not) or race.

## 13 NONCLINICAL TOXICOLOGY

### 13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

#### Carcinogenesis

Carcinogenicity studies were conducted in Swiss albino mice and Wistar rats. Risperidone was administered in the diet at doses of 0.63 mg/kg, 2.5 mg/kg, and 10 mg/kg for 18 months to mice and for 25 months to rats. These doses are equivalent to approximately 2, 9, and 38 times the maximum recommended human dose (MRHD) for schizophrenia 16 mg/day on a mg/kg basis or 0.2, 0.75, and 3 times the MRHD (mice) or 0.4, 1.5, and 6 times the MRHD (rats) on a mg/m<sup>2</sup> body surface basis. A maximum tolerated dose was not achieved in male mice. There were statistically significant increases in pituitary gland adenomas, endocrine pancreas adenomas, and mammary gland adenocarcinomas. The table below summarizes the multiples of the human dose on a mg/m<sup>2</sup> (mg/kg) basis at which these tumors occurred.

Tumor Type	Species	Sex	Multiples of Maximum Human Dose in mg/m <sup>2</sup> (mg/kg)	
			Lowest Effect Level	Highest No-Effect Level
Pituitary adenomas	mouse	female	0.75 (9.4)	0.2 (2.4)
Endocrine pancreas adenomas	rat	male	1.5 (9.4)	0.4 (2.4)
Mammary gland adenocarcinomas	mouse	female	0.2 (2.4)	none
	rat	female	0.4 (2.4)	none
	rat	male	6.0 (37.5)	1.5 (9.4)
Mammary gland neoplasm, Total	rat	male	1.5 (9.4)	0.4 (2.4)

Antipsychotic drugs have been shown to chronically elevate prolactin levels in rodents. Serum prolactin levels were not measured during the risperidone carcinogenicity studies; however, measurements during subchronic toxicity studies showed that risperidone elevated serum prolactin levels 5-6 fold in mice and rats at the same doses used in the carcinogenicity studies. An increase in mammary, pituitary, and endocrine pancreas neoplasms has been found in rodents after chronic administration of other antipsychotic drugs and is considered to be prolactin-mediated. The relevance for human risk of the findings of prolactin-mediated endocrine tumors in rodents is unknown [see *Warnings and Precautions* (5.6)].

#### Mutagenesis

No evidence of mutagenic or clastogenic potential for risperidone was found in the Ames gene mutation test, the mouse lymphoma assay, the *in vitro* rat hepatocyte DNA-repair assay, *in vivo* micronucleus test in mice, the sex-linked recessive lethal test in *Drosophila*, or the chromosomal aberration test in human lymphocytes or Chinese hamster ovary cells.

### Impairment of Fertility

Risperidone (0.16 to 5 mg/kg) was shown to impair mating, but not fertility, in Wistar rats in three reproductive studies (two Segment I and a multigenerational study) at doses 0.1 to 3 times the maximum recommended human dose (MRHD) on a mg/m<sup>2</sup> body surface area basis. The effect appeared to be in females, since impaired mating behavior was not noted in the Segment I study in which males only were treated. In a subchronic study in Beagle dogs in which risperidone was administered at doses of 0.31 to 5 mg/kg, sperm motility and concentration were decreased at doses 0.6 to 10 times the MRHD on a mg/m<sup>2</sup> body surface area basis. Dose-related decreases were also noted in serum testosterone at the same doses. Serum testosterone and sperm parameters partially recovered, but remained decreased after treatment was discontinued. A no-effect dose could not be determined in either rat or dog.

## **13.2 Animal Toxicology**

Juvenile dogs were treated for 40 weeks with oral risperidone doses of 0.31, 1.25, or 5 mg/kg/day. Decreased bone length and density were observed with a no-effect dose of 0.31 mg/kg/day. This dose produced plasma AUC levels of risperidone plus its active metabolite paliperidone (9-hydroxy-risperidone) which were similar to those in children and adolescents receiving the maximum recommended human dose (MRHD) of 6 mg/day. In addition, a delay in sexual maturation was seen at all doses in both males and females. The above effects showed little or no reversibility in females after a 12 week drug-free recovery period.

In a study in which juvenile rats were treated with oral risperidone from days 12 to 50 of age, a reversible impairment of performance in a test of learning and memory was observed in females only with a no-effect dose of 0.63 mg/kg/day. This dose produced plasma AUC levels of risperidone plus paliperidone about half those observed in humans at the MRHD. No other consistent effects on neurobehavioral or reproductive development were seen up to the highest testable dose of 1.25 mg/kg/day. This dose produced plasma AUC levels of risperidone plus paliperidone which were about two thirds of those observed in humans at the MRHD.

## **14 CLINICAL STUDIES**

### **14.1 Schizophrenia**

#### Adults

##### *Short-Term Efficacy*

The efficacy of risperidone tablets in the treatment of schizophrenia was established in four short-term (4- to 8-week) controlled trials of psychotic inpatients who met DSM-III-R criteria for schizophrenia.

Several instruments were used for assessing psychiatric signs and symptoms in these



studies, among them the Brief Psychiatric Rating Scale (BPRS), a multi-item inventory of general psychopathology traditionally used to evaluate the effects of drug treatment in schizophrenia. The BPRS psychosis cluster (conceptual disorganization, hallucinatory behavior, suspiciousness, and unusual thought content) is considered a particularly useful subset for assessing actively psychotic schizophrenic patients. A second traditional assessment, the Clinical Global Impression (CGI), reflects the impression of a skilled observer, fully familiar with the manifestations of schizophrenia, about the overall clinical state of the patient. In addition, the Positive and Negative Syndrome Scale (PANSS) and the Scale for Assessing Negative Symptoms (SANS) were employed.

The results of the trials follow:

1. In a 6-week, placebo-controlled trial (n=160) involving titration of risperidone tablets in doses up to 10 mg/day (twice-daily schedule), risperidone tablets were generally superior to placebo on the BPRS total score, on the BPRS psychosis cluster, and marginally superior to placebo on the SANS.
2. In an 8-week, placebo-controlled trial (n=513) involving 4 fixed doses of risperidone tablets (2 mg/day, 6 mg/day, 10 mg/day, and 16 mg/day, on a twice-daily schedule), all 4 risperidone tablets groups were generally superior to placebo on the BPRS total score, BPRS psychosis cluster, and CGI severity score; the 3 highest risperidone tablets dose groups were generally superior to placebo on the PANSS negative subscale. The most consistently positive responses on all measures were seen for the 6 mg dose group, and there was no suggestion of increased benefit from larger doses.
3. In an 8-week, dose comparison trial (n=1356) involving 5 fixed doses of risperidone tablets (1 mg/day, 4 mg/day, 8 mg/day, 12 mg/day, and 16 mg/day, on a twice-daily schedule), the four highest risperidone tablets dose groups were generally superior to the 1 mg risperidone tablets dose group on BPRS total score, BPRS psychosis cluster, and CGI severity score. None of the dose groups were superior to the 1 mg group on the PANSS negative subscale. The most consistently positive responses were seen for the 4 mg dose group.
4. In a 4-week, placebo-controlled dose comparison trial (n=246) involving 2 fixed doses of risperidone tablets (4 and 8 mg/day on a once-daily schedule), both risperidone tablets dose groups were generally superior to placebo on several PANSS measures, including a response measure (>20% reduction in PANSS total score), PANSS total score, and the BPRS psychosis cluster (derived from PANSS). The results were generally stronger for the 8 mg than for the 4 mg dose group.

### *Long-Term Efficacy*

In a longer-term trial, 365 adult outpatients predominantly meeting DSM-IV criteria for schizophrenia and who had been clinically stable for at least 4 weeks on an antipsychotic medication were randomized to risperidone tablets (2-8 mg/day) or to an active comparator, for 1 to 2 years of observation for relapse. Patients receiving risperidone tablets experienced a significantly longer time to relapse over this time period compared to those receiving the active comparator.

### Pediatrics

The efficacy of risperidone tablets in the treatment of schizophrenia in adolescents aged 13-17 years was demonstrated in two short-term (6 and 8 weeks), double-blind controlled trials. All patients met DSM-IV diagnostic criteria for schizophrenia and were

experiencing an acute episode at time of enrollment. In the first trial (study #1), patients were randomized into one of three treatment groups: Risperidone tablets 1-3 mg/day (n = 55, mean modal dose = 2.6 mg), risperidone tablets 4-6 mg/day (n = 51, mean modal dose = 5.3 mg), or placebo (n = 54). In the second trial (study #2), patients were randomized to either risperidone tablets 0.15-0.6 mg/day (n = 132, mean modal dose = 0.5 mg) or risperidone tablets 1.5-6 mg/day (n = 125, mean modal dose = 4 mg). In all cases, study medication was initiated at 0.5 mg/day (with the exception of the 0.15-0.6 mg/day group in study #2, where the initial dose was 0.05 mg/day) and titrated to the target dosage range by approximately Day 7. Subsequently, dosage was increased to the maximum tolerated dose within the target dose range by Day 14. The primary efficacy variable in all studies was the mean change from baseline in total PANSS score.

Results of the studies demonstrated efficacy of risperidone tablets in all dose groups from 1-6 mg/day compared to placebo, as measured by significant reduction of total PANSS score. The efficacy on the primary parameter in the 1-3 mg/day group was comparable to the 4-6 mg/day group in study #1, and similar to the efficacy demonstrated in the 1.5-6 mg/day group in study #2. In study #2, the efficacy in the 1.5-6 mg/day group was statistically significantly greater than that in the 0.15-0.6 mg/day group. Doses higher than 3 mg/day did not reveal any trend towards greater efficacy.

## **14.2 Bipolar Mania - Monotherapy**

### Adults

The efficacy of risperidone tablets in the treatment of acute manic or mixed episodes was established in two short-term (3-week) placebo-controlled trials in patients who met the DSM-IV criteria for Bipolar I Disorder with manic or mixed episodes. These trials included patients with or without psychotic features.

The primary rating instrument used for assessing manic symptoms in these trials was the Young Mania Rating Scale (YMRS), an 11-item clinician-rated scale traditionally used to assess the degree of manic symptomatology (irritability, disruptive/aggressive behavior, sleep, elevated mood, speech, increased activity, sexual interest, language/thought disorder, thought content, appearance, and insight) in a range from 0 (no manic features) to 60 (maximum score). The primary outcome in these trials was change from baseline in the YMRS total score. The results of the trials follow:

1. In one 3-week placebo-controlled trial (n=246), limited to patients with manic episodes, which involved a dose range of risperidone tablets 1-6 mg/day, once daily, starting at 3 mg/day (mean modal dose was 4.1 mg/day), risperidone tablets were superior to placebo in the reduction of YMRS total score.
2. In another 3-week placebo-controlled trial (n=286), which involved a dose range of 1-6 mg/day, once daily, starting at 3 mg/day (mean modal dose was 5.6 mg/day), risperidone tablets were superior to placebo in the reduction of YMRS total score.

### Pediatrics

The efficacy of risperidone tablets in the treatment of mania in children or adolescents with Bipolar I disorder was demonstrated in a 3-week, randomized, double-blind, placebo-controlled, multicenter trial including patients ranging in ages from 10 to 17 years who were experiencing a manic or mixed episode of bipolar I disorder. Patients were randomized into one of three treatment groups: Risperidone tablets 0.5-2.5

mg/day (n = 50, mean modal dose = 1.9 mg), risperidone tablets 3-6 mg/day (n = 61, mean modal dose = 4.7 mg), or placebo (n = 58). In all cases, study medication was initiated at 0.5 mg/day and titrated to the target dosage range by Day 7, with further increases in dosage to the maximum tolerated dose within the targeted dose range by Day 10. The primary rating instrument used for assessing efficacy in this study was the mean change from baseline in the total YMRS score.

Results of this study demonstrated efficacy of risperidone tablets in both dose groups compared with placebo, as measured by significant reduction of total YMRS score. The efficacy on the primary parameter in the 3-6 mg/day dose group was comparable to the 0.5-2.5 mg/day dose group. Doses higher than 2.5 mg/day did not reveal any trend towards greater efficacy.

### **14.3 Bipolar Mania - Adjunctive Therapy with Lithium or Valproate**

The efficacy of risperidone tablets with concomitant lithium or valproate in the treatment of acute manic or mixed episodes was established in one controlled trial in adult patients who met the DSM-IV criteria for Bipolar I Disorder. This trial included patients with or without psychotic features and with or without a rapid-cycling course.

In this 3-week placebo-controlled combination trial, 148 in- or outpatients on lithium or valproate therapy with inadequately controlled manic or mixed symptoms were randomized to receive risperidone tablets, placebo, or an active comparator, in combination with their original therapy. Risperidone tablets, in a dose range of 1-6 mg/day, once daily, starting at 2 mg/day (mean modal dose of 3.8 mg/day), combined with lithium or valproate (in a therapeutic range of 0.6 mEq/L to 1.4 mEq/L or 50 mcg/mL to 120 mcg/mL, respectively) was superior to lithium or valproate alone in the reduction of YMRS total score.

In a second 3-week placebo-controlled combination trial, 142 in- or outpatients on lithium, valproate, or carbamazepine therapy with inadequately controlled manic or mixed symptoms were randomized to receive risperidone tablets or placebo, in combination with their original therapy. Risperidone tablets, in a dose range of 1-6 mg/day, once daily, starting at 2 mg/day (mean modal dose of 3.7 mg/day), combined with lithium, valproate, or carbamazepine (in therapeutic ranges of 0.6 mEq/L to 1.4 mEq/L for lithium, 50 mcg/mL to 125 mcg/mL for valproate, or 4-12 mcg/mL for carbamazepine, respectively) was not superior to lithium, valproate, or carbamazepine alone in the reduction of YMRS total score. A possible explanation for the failure of this trial was induction of risperidone and 9-hydroxyrisperidone clearance by carbamazepine, leading to subtherapeutic levels of risperidone and 9-hydroxyrisperidone.

### **14.4 Irritability Associated with Autistic Disorder**

#### Short-Term Efficacy

The efficacy of risperidone tablets in the treatment of irritability associated with autistic disorder was established in two 8-week, placebo-controlled trials in children and adolescents (aged 5 to 16 years) who met the DSM-IV criteria for autistic disorder. Over 90% of these subjects were under 12 years of age and most weighed over 20 kg (16-104.3 kg).

Efficacy was evaluated using two assessment scales: the Aberrant Behavior Checklist (ABC) and the Clinical Global Impression - Change (CGI-C) scale. The primary outcome

measure in both trials was the change from baseline to endpoint in the Irritability subscale of the ABC (ABC-I). The ABC-I subscale measured the emotional and behavioral symptoms of autism, including aggression towards others, deliberate self-injuriousness, temper tantrums, and quickly changing moods. The CGI-C rating at endpoint was a co-primary outcome measure in one of the studies.

The results of these trials are as follows:

1. In one of the 8-week, placebo-controlled trials, children and adolescents with autistic disorder (n=101), aged 5 to 16 years, received twice daily doses of placebo or risperidone tablets 0.5-3.5 mg/day on a weight-adjusted basis. Risperidone tablets, starting at 0.25 mg/day or 0.5 mg/day depending on baseline weight (< 20 kg and  $\geq$  20 kg, respectively) and titrated to clinical response (mean modal dose of 1.9 mg/day, equivalent to 0.06 mg/kg/day), significantly improved scores on the ABC-I subscale and on the CGI-C scale compared with placebo.
2. In the other 8-week, placebo-controlled trial in children with autistic disorder (n=55), aged 5 to 12 years, risperidone tablets 0.02 to 0.06 mg/kg/day given once or twice daily, starting at 0.01 mg/kg/day and titrated to clinical response (mean modal dose of 0.05 mg/kg/day, equivalent to 1.4 mg/day), significantly improved scores on the ABC-I subscale compared with placebo.

A third trial was a 6-week, multicenter, randomized, double blind, placebo-controlled, fixed-dose study to evaluate the efficacy and safety of a lower than recommended dose of risperidone in subjects (N=96) 5 to 17 years of age with autistic disorder (defined by DSM-IV criteria) and associated irritability and related behavioral symptoms.

Approximately 77% of patients were younger than 12 years of age (mean age = 9), and 88% were male. Most patients (73%) weighed less than 45 kg (mean weight = 40 kg). Approximately 90% of patients were antipsychotic-naïve before entering the study.

There were two weight-based, fixed doses of risperidone (high-dose and low-dose). The high dose was 1.25 mg per day for patients weighing 20 to < 45 kg, and it was 1.75 mg per day for patients weighing  $\geq$  45 kg. The low dose was 0.125 mg per day for patients weighing 20 to < 45 kg, and it was 0.175 mg per day for patients weighing  $\geq$  45 kg. The dose was administered once daily in the morning, or in the evening if sedation occurred.

The primary efficacy endpoint was the mean change in the Aberrant Behavior Checklist – Irritability subscale (ABC-I) score from baseline to the end of Week 6. The study demonstrated the efficacy of high-dose risperidone, as measured by the mean change in ABC-I score. It did not demonstrate efficacy for low-dose risperidone. The mean baseline ABC-I scores were 29 in the placebo group (n = 35), 27 in the risperidone low-dose group (n = 30), and 28 in the risperidone high-dose group (n = 31). The mean changes in ABC-I scores were -3.5, -7.4, and -12.4 in the placebo, low-dose, and high-dose group respectively. The results in the high-dose group were statistically significant ( $p < 0.001$ ) but not in the low-dose group ( $p = 0.164$ ).

### Long-Term Efficacy

Following completion of the first 8-week double-blind study, 63 patients entered an open-label study extension where they were treated with risperidone tablets for 4 or 6 months (depending on whether they received risperidone tablets or placebo in the double-blind study). During this open-label treatment period, patients were maintained on a mean modal dose of risperidone tablets of 1.8-2.1 mg/day (equivalent to 0.05 - 0.07 mg/kg/day).

Patients who maintained their positive response to risperidone tablets (response was defined as  $\geq 25\%$  improvement on the ABC-I subscale and a CGI-C rating of 'much improved' or 'very much improved') during the 4-6 month open-label treatment phase for about 140 days, on average, were randomized to receive risperidone tablets or placebo during an 8-week, double-blind withdrawal study (n=39 of the 63 patients). A pre-planned interim analysis of data from patients who completed the withdrawal study (n=32), undertaken by an independent Data Safety Monitoring Board, demonstrated a significantly lower relapse rate in the risperidone tablets group compared with the placebo group. Based on the interim analysis results, the study was terminated due to demonstration of a statistically significant effect on relapse prevention. Relapse was defined as  $\geq 25\%$  worsening on the most recent assessment of the ABC-I subscale (in relation to baseline of the randomized withdrawal phase).

## **16 HOW SUPPLIED/STORAGE AND HANDLING**

### **16.1 How Supplied**

#### **Risperidone Tablets**

**Risperidone Tablets USP 0.5 mg** are orange, circular, biconvex, film-coated tablets, engraved with 'RI2' on one side and plain on other and are supplied as follows:

Bottles of 30's NDC 63187-642-30

Bottles of 60's NDC 63187-642-60

Bottles of 90's NDC 63187-642-90

### **16.2 Storage and Handling**

Risperidone tablets should be stored at 20° to 25°C (68° to 77°F); excursions permitted between 15° to 30°C (59° to 86°F) [see USP controlled room temperature]. Protect from light and moisture.

Keep out of reach of children.

## **17 PATIENT COUNSELING INFORMATION**

Physicians are advised to discuss the following issues with patients for whom they prescribe risperidone tablets and their caregivers:

### **17.1 Orthostatic Hypotension**

Advise patients and caregivers about the risk of orthostatic hypotension, especially during the period of initial dose titration [see *Warnings and Precautions (5.7)*].

### **17.2 Interference with Cognitive and Motor Performance**

Inform patients and caregivers that risperidone tablets have the potential to impair judgment, thinking, or motor skills. Advise caution about operating hazardous machinery, including automobiles, until patients are reasonably certain that risperidone tablets therapy does not affect them adversely [see *Warnings and Precautions (5.9)*].

### **17.3 Pregnancy**

Advise patients and caregivers to notify their physician if the patient becomes pregnant or intends to become pregnant during therapy [see *Use in Specific Populations (8.1)*].

### **17.4 Nursing**

Inform patients and caregivers that risperidone and its active metabolite are present in human breast milk; there is a potential for serious adverse reactions from risperidone tablets in nursing infants. Advise patients that the decision whether to discontinue nursing or to discontinue the risperidone tablets should take into account the importance of the drug to the patient [see *Use in Specific Populations (8.3)*].

### **17.5 Concomitant Medication**

Advise patients and caregivers to inform their physicians if the patient is taking, or plans to take, any prescription or over-the-counter drugs, because there is a potential for interactions [see *Drug Interactions (7)*].

### **17.6 Alcohol**

Advise patients to avoid alcohol while taking risperidone tablets [see *Drug Interactions (7.2)*].

### **17.8 Metabolic Changes**

Inform patients and caregivers that treatment with risperidone tablets can be associated with hyperglycemia and diabetes mellitus, dyslipidemia, and weight gain [see *Warnings and Precautions (5.5)*].

### **17.9 Tardive Dyskinesia**

Inform patients and caregivers about the risk of tardive dyskinesia [see *Warnings and Precautions (5.4)*].

Risperidone tablets USP

Marketed by:

**Ajanta Pharma USA Inc.**

Bridgewater, NJ 08807.

Manufactured by:

**Ajanta Pharma Limited**

B-4/5/6, MIDC Area,

Paithan 431 148, India.

Revised: September 2015

Repackaged by:

**Proficient Rx LP**

Thousand Oaks, CA 91320

**PACKAGE LABEL.PRINCIPAL DISPLAY PANEL-0.5MG BOTTLE LABEL**

NDC 63187-642-30

**30 Tablets**

**risperiDONE Tablets USP**  
**0.5 mg**

Rx only



Scan Here



NDC 63187-642-30

Packaged By: Proficient Rx LP  
Thousand Oaks, CA 91320

**RX Only**

Risperidone 0.5mg  
#30 Tablets  
Lot #:00000 SN# MASTER  
NDC 63187-642-30 Exp:00/00/00

Risperidone 0.5mg  
#30 Tablets  
Lot #:00000 SN# MASTER  
NDC 63187-642-30 Exp:00/00/00

Risperidone 0.5mg  
#30 Tablets  
Lot #:00000 SN# MASTER  
NDC 63187-642-30 Exp:00/00/00

GTIN: 00363187642303  
SN# MASTER  
Exp 00/00/00  
Lot #:00000



**Risperidone 0.5mg**

**#30 Tablets**

Each film coated tablet contains: Risperidone USP  
0.5 mg

*Orange, circular, biconvex, film-coated tablets, engraved with 'R12' on one side  
and plain on other*

Product ID: PR064230

Marketed By: Ajanta Pharma USA Inc. Bridgewater, NJ 08807. Made in India.

Store at 20°-25°C (68°-77°F)

Keep medication out of the reach of children

## RISPERIDONE

risperidone tablet

### Product Information

<b>Product Type</b>	HUMAN PRESCRIPTION DRUG	<b>Item Code (Source)</b>	NDC:63187-642(NDC:27241- 003)
<b>Route of Administration</b>	ORAL		

### Active Ingredient/Active Moiety

Ingredient Name	Basis of Strength	Strength
<b>RISPERIDONE</b> (UNII: L6UH7ZF8HC) (RISPERIDONE - UNII:L6UH7ZF8HC)	RISPERIDONE	0.5 mg

### Inactive Ingredients

Ingredient Name	Strength
<b>SILICON DIOXIDE</b> (UNII: ETJ7Z6XBU4)	
<b>HYPROMELLOSE, UNSPECIFIED</b> (UNII: 3NXW29V3WO)	
<b>MAGNESIUM STEARATE</b> (UNII: 70097M6I3O)	
<b>MICROCRYSTALLINE CELLULOSE</b> (UNII: OP1R32D61U)	

<b>PROPYLENE GLYCOL</b> (UNII: 6DC9Q167V3)	
<b>SODIUM LAURYL SULFATE</b> (UNII: 368GB5141J)	
<b>SODIUM STARCH GLYCOLATE TYPE A POTATO</b> (UNII: 5856J3G2A2)	
<b>TALC</b> (UNII: 7SEV7J4R1U)	
<b>TITANIUM DIOXIDE</b> (UNII: 15FIX9V2JP)	
<b>FD&amp;C YELLOW NO. 6</b> (UNII: H77VEI93A8)	
<b>LACTOSE MONOHYDRATE</b> (UNII: EWQ57Q8I5X)	

### Product Characteristics

<b>Color</b>	ORANGE	<b>Score</b>	no score
<b>Shape</b>	ROUND (CIRCULAR)	<b>Size</b>	7mm
<b>Flavor</b>		<b>Imprint Code</b>	RI2
<b>Contains</b>			

### Packaging

#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:63187-642-30	30 in 1 BOTTLE; Type 0: Not a Combination Product	12/01/2018	
2	NDC:63187-642-60	60 in 1 BOTTLE; Type 0: Not a Combination Product	12/01/2018	
3	NDC:63187-642-90	90 in 1 BOTTLE; Type 0: Not a Combination Product	12/01/2018	

### Marketing Information

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
ANDA	ANDA201003	09/09/2015	

**Labeler** - Proficient Rx LP (079196022)

### Establishment

Name	Address	ID/FEI	Business Operations
Proficient Rx LP		079196022	REPACK(63187-642) , RELABEL(63187-642)

Revised: 10/2022

Proficient Rx LP