

PV 5194 AMP

**ZYPREXA<sup>®</sup>**  
**Olanzapine Tablets**

**ZYPREXA<sup>®</sup> ZYDIS<sup>®</sup>**  
**Olanzapine Orally Disintegrating Tablets**

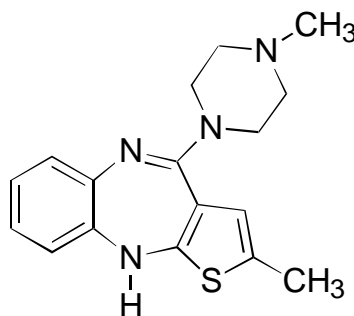
**ZYPREXA<sup>®</sup> IntraMuscular**  
**Olanzapine for Injection**

**WARNING**

**Increased Mortality in Elderly Patients with Dementia-Related Psychosis — Elderly patients with dementia-related psychosis treated with atypical antipsychotic drugs are at an increased risk of death compared to placebo. Analyses of seventeen placebo-controlled trials (modal duration of 10 weeks) in these patients revealed a risk of death in the drug-treated patients of between 1.6 to 1.7 times that seen 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. ZYPREXA (olanzapine) is not approved for the treatment of patients with dementia-related psychosis (see WARNINGS).**

**DESCRIPTION**

ZYPREXA (olanzapine) is a psychotropic agent that belongs to the thienobenzodiazepine class. The chemical designation is 2-methyl-4-(4-methyl-1-piperazinyl)-10H-thieno[2,3-b][1,5]benzodiazepine. The molecular formula is C<sub>17</sub>H<sub>20</sub>N<sub>4</sub>S, which corresponds to a molecular weight of 312.44. The chemical structure is:



Olanzapine is a yellow crystalline solid, which is practically insoluble in water.

ZYPREXA tablets are intended for oral administration only.

Each tablet contains olanzapine equivalent to 2.5 mg (8 μmol), 5 mg (16 μmol), 7.5 mg (24 μmol), 10 mg (32 μmol), 15 mg (48 μmol), or 20 mg (64 μmol). Inactive ingredients are carnauba wax, crospovidone, hydroxypropyl cellulose, hypromellose, lactose, magnesium stearate, microcrystalline cellulose, and other inactive ingredients. The color coating contains Titanium Dioxide (all strengths), FD&C Blue No. 2 Aluminum Lake (15 mg), or Synthetic Red Iron Oxide (20 mg). The 2.5, 5, 7.5, and 10 mg tablets are imprinted with edible ink which contains FD&C Blue No. 2 Aluminum Lake.

36 ZYPREXA ZYDIS (olanzapine orally disintegrating tablets) is intended for oral administration  
37 only.

38 Each orally disintegrating tablet contains olanzapine equivalent to 5 mg (16  $\mu$ mol), 10 mg  
39 (32  $\mu$ mol), 15 mg (48  $\mu$ mol) or 20 mg (64  $\mu$ mol). It begins disintegrating in the mouth within  
40 seconds, allowing its contents to be subsequently swallowed with or without liquid.

41 ZYPREXA ZYDIS (olanzapine orally disintegrating tablets) also contains the following inactive  
42 ingredients: gelatin, mannitol, aspartame, sodium methyl paraben and sodium propyl paraben.

43 ZYPREXA IntraMuscular (olanzapine for injection) is intended for intramuscular use only.

44 Each vial provides for the administration of 10 mg (32  $\mu$ mol) olanzapine with inactive  
45 ingredients 50 mg lactose monohydrate and 3.5 mg tartaric acid. Hydrochloric acid and/or  
46 sodium hydroxide may have been added during manufacturing to adjust pH.

## 47 CLINICAL PHARMACOLOGY

### 48 Pharmacodynamics

49 Olanzapine is a selective monoaminergic antagonist with high affinity binding to the following  
50 receptors: serotonin 5HT<sub>2A/2C</sub>, 5HT<sub>6</sub>, ( $K_i$ =4, 11, and 5 nM, respectively), dopamine D<sub>1-4</sub>  
51 ( $K_i$ =11-31 nM), histamine H<sub>1</sub> ( $K_i$ =7 nM), and adrenergic  $\alpha_1$  receptors ( $K_i$ =19 nM). Olanzapine is  
52 an antagonist with moderate affinity binding for serotonin 5HT<sub>3</sub> ( $K_i$ =57 nM) and muscarinic M<sub>1-5</sub>  
53 ( $K_i$ =73, 96, 132, 32, and 48 nM, respectively). Olanzapine binds weakly to GABA<sub>A</sub>, BZD, and  
54  $\beta$  adrenergic receptors ( $K_i$ >10  $\mu$ M).

55 The mechanism of action of olanzapine, as with other drugs having efficacy in schizophrenia,  
56 is unknown. However, it has been proposed that this drug's efficacy in schizophrenia is mediated  
57 through a combination of dopamine and serotonin type 2 (5HT<sub>2</sub>) antagonism. The mechanism of  
58 action of olanzapine in the treatment of acute manic episodes associated with Bipolar I Disorder  
59 is unknown.

60 Antagonism at receptors other than dopamine and 5HT<sub>2</sub> may explain some of the other  
61 therapeutic and side effects of olanzapine. Olanzapine's antagonism of muscarinic M<sub>1-5</sub> receptors  
62 may explain its anticholinergic-like effects. Olanzapine's antagonism of histamine H<sub>1</sub> receptors  
63 may explain the somnolence observed with this drug. Olanzapine's antagonism of adrenergic  $\alpha_1$   
64 receptors may explain the orthostatic hypotension observed with this drug.

### 65 Pharmacokinetics

#### 66 Oral Administration

67 Olanzapine is well absorbed and reaches peak concentrations in approximately 6 hours  
68 following an oral dose. It is eliminated extensively by first pass metabolism, with approximately  
69 40% of the dose metabolized before reaching the systemic circulation. Food does not affect the  
70 rate or extent of olanzapine absorption. Pharmacokinetic studies showed that ZYPREXA tablets  
71 and ZYPREXA ZYDIS (olanzapine orally disintegrating tablets) dosage forms of olanzapine are  
72 bioequivalent.

73 Olanzapine displays linear kinetics over the clinical dosing range. Its half-life ranges from 21 to  
74 54 hours (5th to 95th percentile; mean of 30 hr), and apparent plasma clearance ranges from  
75 12 to 47 L/hr (5th to 95th percentile; mean of 25 L/hr).

76 Administration of olanzapine once daily leads to steady-state concentrations in about one week  
77 that are approximately twice the concentrations after single doses. Plasma concentrations,  
78 half-life, and clearance of olanzapine may vary between individuals on the basis of smoking  
79 status, gender, and age (*see* Special Populations).

80 Olanzapine is extensively distributed throughout the body, with a volume of distribution of  
81 approximately 1000 L. It is 93% bound to plasma proteins over the concentration range of 7 to  
82 1100 ng/mL, binding primarily to albumin and  $\alpha_1$ -acid glycoprotein.

83 Metabolism and Elimination — Following a single oral dose of <sup>14</sup>C labeled olanzapine, 7% of  
84 the dose of olanzapine was recovered in the urine as unchanged drug, indicating that olanzapine  
85 is highly metabolized. Approximately 57% and 30% of the dose was recovered in the urine and  
86 feces, respectively. In the plasma, olanzapine accounted for only 12% of the AUC for total  
87 radioactivity, indicating significant exposure to metabolites. After multiple dosing, the major  
88 circulating metabolites were the 10-N-glucuronide, present at steady state at 44% of the  
89 concentration of olanzapine, and 4'-N-desmethyl olanzapine, present at steady state at 31% of the  
90 concentration of olanzapine. Both metabolites lack pharmacological activity at the concentrations  
91 observed.

92 Direct glucuronidation and cytochrome P450 (CYP) mediated oxidation are the primary  
93 metabolic pathways for olanzapine. In vitro studies suggest that CYPs 1A2 and 2D6, and the  
94 flavin-containing monooxygenase system are involved in olanzapine oxidation.  
95 CYP2D6 mediated oxidation appears to be a minor metabolic pathway in vivo, because the  
96 clearance of olanzapine is not reduced in subjects who are deficient in this enzyme.

### 97 **Intramuscular Administration**

98 ZYPREXA IntraMuscular results in rapid absorption with peak plasma concentrations  
99 occurring within 15 to 45 minutes. Based upon a pharmacokinetic study in healthy volunteers, a  
100 5 mg dose of intramuscular olanzapine for injection produces, on average, a maximum plasma  
101 concentration approximately 5 times higher than the maximum plasma concentration produced  
102 by a 5 mg dose of oral olanzapine. Area under the curve achieved after an intramuscular dose is  
103 similar to that achieved after oral administration of the same dose. The half-life observed after  
104 intramuscular administration is similar to that observed after oral dosing. The pharmacokinetics  
105 are linear over the clinical dosing range. Metabolic profiles after intramuscular administration are  
106 qualitatively similar to metabolic profiles after oral administration.

### 107 **Special Populations**

108 Renal Impairment — Because olanzapine is highly metabolized before excretion and only  
109 7% of the drug is excreted unchanged, renal dysfunction alone is unlikely to have a major impact  
110 on the pharmacokinetics of olanzapine. The pharmacokinetic characteristics of olanzapine were  
111 similar in patients with severe renal impairment and normal subjects, indicating that dosage  
112 adjustment based upon the degree of renal impairment is not required. In addition, olanzapine is  
113 not removed by dialysis. The effect of renal impairment on metabolite elimination has not been  
114 studied.

115 Hepatic Impairment — Although the presence of hepatic impairment may be expected to  
116 reduce the clearance of olanzapine, a study of the effect of impaired liver function in  
117 subjects (n=6) with clinically significant (Childs Pugh Classification A and B) cirrhosis revealed  
118 little effect on the pharmacokinetics of olanzapine.

119 Age — In a study involving 24 healthy subjects, the mean elimination half-life of olanzapine  
120 was about 1.5 times greater in elderly (>65 years) than in non-elderly subjects (≤65 years).  
121 Caution should be used in dosing the elderly, especially if there are other factors that might  
122 additively influence drug metabolism and/or pharmacodynamic sensitivity (*see* DOSAGE AND  
123 ADMINISTRATION).

124 Gender — Clearance of olanzapine is approximately 30% lower in women than in men. There  
125 were, however, no apparent differences between men and women in effectiveness or adverse  
126 effects. Dosage modifications based on gender should not be needed.

127 Smoking Status — Olanzapine clearance is about 40% higher in smokers than in nonsmokers,  
128 although dosage modifications are not routinely recommended.

129 Race — In vivo studies have shown that exposures are similar among Japanese, Chinese and  
130 Caucasians, especially after normalization for body weight differences. Dosage modifications for  
131 race are, therefore, not recommended.

132 Combined Effects — The combined effects of age, smoking, and gender could lead to  
133 substantial pharmacokinetic differences in populations. The clearance in young smoking males,  
134 for example, may be 3 times higher than that in elderly nonsmoking females. Dosing  
135 modification may be necessary in patients who exhibit a combination of factors that may result in  
136 slower metabolism of olanzapine (*see* DOSAGE AND ADMINISTRATION).

137 For specific information about the pharmacology of lithium or valproate, refer to the  
138 CLINICAL PHARMACOLOGY section of the package inserts for these other products.

## 139 **Clinical Efficacy Data**

### 140 **Schizophrenia**

141 The efficacy of oral olanzapine in the treatment of schizophrenia was established in  
142 2 short-term (6-week) controlled trials of inpatients who met DSM III-R criteria for  
143 schizophrenia. A single haloperidol arm was included as a comparative treatment in one of the  
144 two trials, but this trial did not compare these two drugs on the full range of clinically relevant  
145 doses for both.

146 Several instruments were used for assessing psychiatric signs and symptoms in these studies,  
147 among them the Brief Psychiatric Rating Scale (BPRS), a multi-item inventory of general  
148 psychopathology traditionally used to evaluate the effects of drug treatment in schizophrenia. The  
149 BPRS psychosis cluster (conceptual disorganization, hallucinatory behavior, suspiciousness, and  
150 unusual thought content) is considered a particularly useful subset for assessing actively  
151 psychotic schizophrenic patients. A second traditional assessment, the Clinical Global  
152 Impression (CGI), reflects the impression of a skilled observer, fully familiar with the  
153 manifestations of schizophrenia, about the overall clinical state of the patient. In addition,  
154 two more recently developed scales were employed; these included the 30-item Positive and  
155 Negative Symptoms Scale (PANSS), in which are embedded the 18 items of the BPRS, and the  
156 Scale for Assessing Negative Symptoms (SANS). The trial summaries below focus on the  
157 following outcomes: PANSS total and/or BPRS total; BPRS psychosis cluster; PANSS negative  
158 subscale or SANS; and CGI Severity. The results of the trials follow:

159 (1) In a 6-week, placebo-controlled trial (n=149) involving two fixed olanzapine doses of 1 and  
160 10 mg/day (once daily schedule), olanzapine, at 10 mg/day (but not at 1 mg/day), was superior to  
161 placebo on the PANSS total score (also on the extracted BPRS total), on the BPRS psychosis  
162 cluster, on the PANSS Negative subscale, and on CGI Severity.

163 (2) In a 6-week, placebo-controlled trial (n=253) involving 3 fixed dose ranges of olanzapine  
164 ( $5 \pm 2.5$  mg/day,  $10 \pm 2.5$  mg/day, and  $15 \pm 2.5$  mg/day) on a once daily schedule, the  
165 two highest olanzapine dose groups (actual mean doses of 12 and 16 mg/day, respectively) were  
166 superior to placebo on BPRS total score, BPRS psychosis cluster, and CGI severity score; the  
167 highest olanzapine dose group was superior to placebo on the SANS. There was no clear  
168 advantage for the high dose group over the medium dose group.

169 Examination of population subsets (race and gender) did not reveal any differential  
170 responsiveness on the basis of these subgroupings.

171 In a longer-term trial, adult outpatients (n=326) who predominantly met DSM-IV criteria for  
172 schizophrenia and who remained stable on olanzapine during open label treatment for at least  
173 8 weeks were randomized to continuation on their current olanzapine doses (ranging from 10 to  
174 20 mg/day) or to placebo. The follow-up period to observe patients for relapse, defined in terms  
175 of increases in BPRS positive symptoms or hospitalization, was planned for 12 months, however,  
176 criteria were met for stopping the trial early due to an excess of placebo relapses compared to  
177 olanzapine relapses, and olanzapine was superior to placebo on time to relapse, the primary  
178 outcome for this study. Thus, olanzapine was more effective than placebo at maintaining efficacy  
179 in patients stabilized for approximately 8 weeks and followed for an observation period of up to  
180 8 months.

181 **Bipolar Disorder**

182 Monotherapy — The efficacy of oral olanzapine in the treatment of acute manic or mixed  
183 episodes was established in 2 short-term (one 3-week and one 4-week) placebo-controlled trials  
184 in patients who met the DSM-IV criteria for Bipolar I Disorder with manic or mixed episodes.  
185 These trials included patients with or without psychotic features and with or without a  
186 rapid-cycling course.

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

194 (1) In one 3-week placebo-controlled trial (n=67) which involved a dose range of olanzapine  
195 (5-20 mg/day, once daily, starting at 10 mg/day), olanzapine was superior to placebo in the  
196 reduction of Y-MRS total score. In an identically designed trial conducted simultaneously with  
197 the first trial, olanzapine demonstrated a similar treatment difference, but possibly due to sample  
198 size and site variability, was not shown to be superior to placebo on this outcome.

199 (2) In a 4-week placebo-controlled trial (n=115) which involved a dose range of olanzapine  
200 (5-20 mg/day, once daily, starting at 15 mg/day), olanzapine was superior to placebo in the  
201 reduction of Y-MRS total score.

202 (3) In another trial, 361 patients meeting DSM-IV criteria for a manic or mixed episode of  
203 bipolar disorder who had responded during an initial open-label treatment phase for about two  
204 weeks, on average, to olanzapine 5 to 20 mg/day were randomized to either continuation of  
205 olanzapine at their same dose (n=225) or to placebo (n=136), for observation of relapse.  
206 Approximately 50% of the patients had discontinued from the olanzapine group by day 59 and  
207 50% of the placebo group had discontinued by day 23 of double-blind treatment. Response  
208 during the open-label phase was defined by having a decrease of the Y-MRS total score to  $\leq 12$   
209 and HAM-D 21 to  $\leq 8$ . Relapse during the double-blind phase was defined as an increase of the  
210 Y-MRS or HAM-D 21 total score to  $\geq 15$ , or being hospitalized for either mania or depression. In  
211 the randomized phase, patients receiving continued olanzapine experienced a significantly longer  
212 time to relapse.

213 Combination Therapy — The efficacy of oral olanzapine with concomitant lithium or valproate  
214 in the treatment of acute manic episodes was established in two controlled trials in patients who  
215 met the DSM-IV criteria for Bipolar I Disorder with manic or mixed episodes. These trials  
216 included patients with or without psychotic features and with or without a rapid-cycling course.  
217 The results of the trials follow:

218 (1) In one 6-week placebo-controlled combination trial, 175 outpatients on lithium or valproate  
219 therapy with inadequately controlled manic or mixed symptoms (Y-MRS  $\geq 16$ ) were randomized  
220 to receive either olanzapine or placebo, in combination with their original therapy. Olanzapine  
221 (in a dose range of 5-20 mg/day, once daily, starting at 10 mg/day) combined with lithium or  
222 valproate (in a therapeutic range of 0.6 mEq/L to 1.2 mEq/L or 50  $\mu$ g/mL to 125  $\mu$ g/mL,  
223 respectively) was superior to lithium or valproate alone in the reduction of Y-MRS total score.

224 (2) In a second 6-week placebo-controlled combination trial, 169 outpatients on lithium or  
225 valproate therapy with inadequately controlled manic or mixed symptoms (Y-MRS  $\geq 16$ ) were  
226 randomized to receive either olanzapine or placebo, in combination with their original therapy.  
227 Olanzapine (in a dose range of 5-20 mg/day, once daily, starting at 10 mg/day) combined with  
228 lithium or valproate (in a therapeutic range of 0.6 mEq/L to 1.2 mEq/L or 50  $\mu$ g/mL to  
229 125  $\mu$ g/mL, respectively) was superior to lithium or valproate alone in the reduction of Y-MRS  
230 total score.

## 231 **Agitation Associated with Schizophrenia and Bipolar I Mania**

232 The efficacy of intramuscular olanzapine for injection for the treatment of agitation was  
233 established in 3 short-term (24 hours of IM treatment) placebo-controlled trials in agitated  
234 inpatients from two diagnostic groups: schizophrenia and Bipolar I Disorder (manic or mixed  
235 episodes). Each of the trials included a single active comparator treatment arm of either  
236 haloperidol injection (schizophrenia studies) or lorazepam injection (bipolar mania study).  
237 Patients enrolled in the trials needed to be: (1) judged by the clinical investigators as clinically  
238 agitated and clinically appropriate candidates for treatment with intramuscular medication, and  
239 (2) exhibiting a level of agitation that met or exceeded a threshold score of  $\geq 14$  on the five items  
240 comprising the Positive and Negative Syndrome Scale (PANSS) Excited Component (i.e., poor  
241 impulse control, tension, hostility, uncooperativeness and excitement items) with at least  
242 one individual item score  $\geq 4$  using a 1-7 scoring system (1=absent, 4=moderate, 7=extreme). In  
243 the studies, the mean baseline PANSS Excited Component score was 18.4, with scores ranging  
244 from 13 to 32 (out of a maximum score of 35), thus suggesting predominantly moderate levels of  
245 agitation with some patients experiencing mild or severe levels of agitation. The primary efficacy  
246 measure used for assessing agitation signs and symptoms in these trials was the change from  
247 baseline in the PANSS Excited Component at 2 hours post-injection. Patients could receive up to  
248 three injections during the 24 hour IM treatment periods; however, patients could not receive the  
249 second injection until after the initial 2 hour period when the primary efficacy measure was  
250 assessed. The results of the trials follow:

251 (1) In a placebo-controlled trial in agitated inpatients meeting DSM-IV criteria for  
252 schizophrenia (n=270), four fixed intramuscular olanzapine for injection doses of 2.5 mg, 5 mg,  
253 7.5 mg and 10 mg were evaluated. All doses were statistically superior to placebo on the PANSS  
254 Excited Component at 2 hours post-injection. However, the effect was larger and more consistent  
255 for the three highest doses. There were no significant pairwise differences for the 7.5 and 10 mg  
256 doses over the 5 mg dose.

257 (2) In a second placebo-controlled trial in agitated inpatients meeting DSM-IV criteria for  
258 schizophrenia (n=311), one fixed intramuscular olanzapine for injection dose of 10 mg was  
259 evaluated. Olanzapine for injection was statistically superior to placebo on the PANSS Excited  
260 Component at 2 hours post-injection.

261 (3) In a placebo-controlled trial in agitated inpatients meeting DSM-IV criteria for Bipolar I  
262 Disorder (and currently displaying an acute manic or mixed episode with or without psychotic  
263 features) (n=201), one fixed intramuscular olanzapine for injection dose of 10 mg was evaluated.  
264 Olanzapine for injection was statistically superior to placebo on the PANSS Excited Component  
265 at 2 hours post-injection.

266 Examination of population subsets (age, race, and gender) did not reveal any differential  
267 responsiveness on the basis of these subgroupings.

## 268 **INDICATIONS AND USAGE**

### 269 **Schizophrenia**

270 Oral ZYPREXA is indicated for the treatment of schizophrenia.

271 The efficacy of ZYPREXA was established in short-term (6-week) controlled trials of  
272 schizophrenic inpatients (*see* CLINICAL PHARMACOLOGY).

273 The effectiveness of oral ZYPREXA at maintaining a treatment response in schizophrenic  
274 patients who had been stable on ZYPREXA for approximately 8 weeks and were then followed  
275 for a period of up to 8 months has been demonstrated in a placebo-controlled trial (*see*  
276 CLINICAL PHARMACOLOGY). Nevertheless, the physician who elects to use ZYPREXA for  
277 extended periods should periodically re-evaluate the long-term usefulness of the drug for the  
278 individual patient (*see* DOSAGE AND ADMINISTRATION).

279 **Bipolar Disorder**

280 Acute Monotherapy — Oral ZYPREXA is indicated for the treatment of acute mixed or manic  
281 episodes associated with Bipolar I Disorder.

282 The efficacy of ZYPREXA was established in two placebo-controlled trials (one 3-week and  
283 one 4-week) with patients meeting DSM-IV criteria for Bipolar I Disorder who currently  
284 displayed an acute manic or mixed episode with or without psychotic features (*see* CLINICAL  
285 PHARMACOLOGY).

286 Maintenance Monotherapy — The benefit of maintaining bipolar patients on monotherapy with  
287 oral ZYPREXA after achieving a responder status for an average duration of two weeks was  
288 demonstrated in a controlled trial (*see* Clinical Efficacy Data *under* CLINICAL  
289 PHARMACOLOGY). The physician who elects to use ZYPREXA for extended periods should  
290 periodically re-evaluate the long-term usefulness of the drug for the individual patient (*see*  
291 DOSAGE AND ADMINISTRATION).

292 Combination Therapy — The combination of oral ZYPREXA with lithium or valproate is  
293 indicated for the short-term treatment of acute mixed or manic episodes associated with Bipolar I  
294 Disorder.

295 The efficacy of ZYPREXA in combination with lithium or valproate was established in  
296 two placebo-controlled (6-week) trials with patients meeting DSM-IV criteria for Bipolar I  
297 Disorder who currently displayed an acute manic or mixed episode with or without psychotic  
298 features (*see* CLINICAL PHARMACOLOGY).

299 **Agitation Associated with Schizophrenia and Bipolar I Mania**

300 ZYPREXA IntraMuscular is indicated for the treatment of agitation associated with  
301 schizophrenia and bipolar I mania. “Psychomotor agitation” is defined in DSM-IV as “excessive  
302 motor activity associated with a feeling of inner tension.” Patients experiencing agitation often  
303 manifest behaviors that interfere with their diagnosis and care, e.g., threatening behaviors,  
304 escalating or urgently distressing behavior, or self-exhausting behavior, leading clinicians to the  
305 use of intramuscular antipsychotic medications to achieve immediate control of the agitation.

306 The efficacy of ZYPREXA IntraMuscular for the treatment of agitation associated with  
307 schizophrenia and bipolar I mania was established in 3 short-term (24 hours) placebo-controlled  
308 trials in agitated inpatients with schizophrenia or Bipolar I Disorder (manic or mixed episodes)  
309 (*see* CLINICAL PHARMACOLOGY).

310 **CONTRAINDICATIONS**

311 ZYPREXA is contraindicated in patients with a known hypersensitivity to the product.

312 For specific information about the contraindications of lithium or valproate, refer to the  
313 CONTRAINDICATIONS section of the package inserts for these other products.

314 **WARNINGS**

315 **Increased Mortality in Elderly Patients with Dementia-Related Psychosis — Elderly**  
316 **patients with dementia-related psychosis treated with atypical antipsychotic drugs are at**  
317 **an increased risk of death compared to placebo. ZYPREXA is not approved for the**  
318 **treatment of patients with dementia-related psychosis (*see* BOX WARNING).**

319 In placebo-controlled clinical trials of elderly patients with dementia-related psychosis, the  
320 incidence of death in olanzapine-treated patients was significantly greater than placebo-treated  
321 patients (3.5% vs 1.5%, respectively).

322 Cerebrovascular Adverse Events, Including Stroke, in Elderly Patients with Dementia-Related  
323 Psychosis — Cerebrovascular adverse events (e.g., stroke, transient ischemic attack), including  
324 fatalities, were reported in patients in trials of olanzapine in elderly patients with  
325 dementia-related psychosis. In placebo-controlled trials, there was a significantly higher  
326 incidence of cerebrovascular adverse events in patients treated with olanzapine compared to

327 patients treated with placebo. Olanzapine is not approved for the treatment of patients with  
328 dementia-related psychosis.

329 Hyperglycemia and Diabetes Mellitus — Hyperglycemia, in some cases extreme and associated  
330 with ketoacidosis or hyperosmolar coma or death, has been reported in patients treated with  
331 atypical antipsychotics including olanzapine. Assessment of the relationship between atypical  
332 antipsychotic use and glucose abnormalities is complicated by the possibility of an increased  
333 background risk of diabetes mellitus in patients with schizophrenia and the increasing incidence  
334 of diabetes mellitus in the general population. Given these confounders, the relationship between  
335 atypical antipsychotic use and hyperglycemia-related adverse events is not completely  
336 understood. However, epidemiological studies suggest an increased risk of treatment-emergent  
337 hyperglycemia-related adverse events in patients treated with the atypical antipsychotics. Precise  
338 risk estimates for hyperglycemia-related adverse events in patients treated with atypical  
339 antipsychotics are not available.

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

350 Neuroleptic Malignant Syndrome (NMS) — A potentially fatal symptom complex sometimes  
351 referred to as Neuroleptic Malignant Syndrome (NMS) has been reported in association with  
352 administration of antipsychotic drugs, including olanzapine. Clinical manifestations of NMS are  
353 hyperpyrexia, muscle rigidity, altered mental status and evidence of autonomic instability  
354 (irregular pulse or blood pressure, tachycardia, diaphoresis and cardiac dysrhythmia). Additional  
355 signs may include elevated creatinine phosphokinase, myoglobinuria (rhabdomyolysis), and acute  
356 renal failure.

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

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

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

371 Tardive Dyskinesia — A syndrome of potentially irreversible, involuntary, dyskinetic  
372 movements may develop in patients treated with antipsychotic drugs. Although the prevalence of  
373 the syndrome appears to be highest among the elderly, especially elderly women, it is impossible  
374 to rely upon prevalence estimates to predict, at the inception of antipsychotic treatment, which  
375 patients are likely to develop the syndrome. Whether antipsychotic drug products differ in their  
376 potential to cause tardive dyskinesia is unknown.

377 The risk of developing tardive dyskinesia and the likelihood that it will become irreversible are  
378 believed to increase as the duration of treatment and the total cumulative dose of antipsychotic  
379 drugs administered to the patient increase. However, the syndrome can develop, although much  
380 less commonly, after relatively brief treatment periods at low doses.

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

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

393 If signs and symptoms of tardive dyskinesia appear in a patient on olanzapine, drug  
394 discontinuation should be considered. However, some patients may require treatment with  
395 olanzapine despite the presence of the syndrome.

396 For specific information about the warnings of lithium or valproate, refer to the WARNINGS  
397 section of the package inserts for these other products.

398

## PRECAUTIONS

### 399 General

400 Hemodynamic Effects — Olanzapine may induce orthostatic hypotension associated with  
401 dizziness, tachycardia, and in some patients, syncope, especially during the initial dose-titration  
402 period, probably reflecting its  $\alpha_1$ -adrenergic antagonistic properties. Hypotension, bradycardia  
403 with or without hypotension, tachycardia, and syncope were also reported during the clinical  
404 trials with intramuscular olanzapine for injection. In an open-label clinical pharmacology study in  
405 non-agitated patients with schizophrenia in which the safety and tolerability of intramuscular  
406 olanzapine were evaluated under a maximal dosing regimen (three 10 mg doses administered  
407 4 hours apart), approximately one-third of these patients experienced a significant orthostatic  
408 decrease in systolic blood pressure (i.e., decrease  $\geq 30$  mmHg) (*see* DOSAGE AND  
409 ADMINISTRATION). Syncope was reported in 0.6% (15/2500) of olanzapine-treated patients in  
410 phase 2-3 oral olanzapine studies and in 0.3% (2/722) of olanzapine-treated patients with  
411 agitation in the intramuscular olanzapine for injection studies. Three normal volunteers in  
412 phase 1 studies with intramuscular olanzapine experienced hypotension, bradycardia, and sinus  
413 pauses of up to 6 seconds that spontaneously resolved (in 2 cases the events occurred on  
414 intramuscular olanzapine, and in 1 case, on oral olanzapine). The risk for this sequence of  
415 hypotension, bradycardia, and sinus pause may be greater in nonpsychiatric patients compared to  
416 psychiatric patients who are possibly more adapted to certain effects of psychotropic drugs.

417 For oral olanzapine therapy, the risk of orthostatic hypotension and syncope may be minimized  
418 by initiating therapy with 5 mg QD (*see* DOSAGE AND ADMINISTRATION). A more gradual  
419 titration to the target dose should be considered if hypotension occurs.

420 For intramuscular olanzapine for injection therapy, patients should remain recumbent if drowsy  
421 or dizzy after injection until examination has indicated that they are not experiencing postural  
422 hypotension, bradycardia, and/or hypoventilation.

423 Olanzapine should be used with particular caution in patients with known cardiovascular  
424 disease (history of myocardial infarction or ischemia, heart failure, or conduction abnormalities),  
425 cerebrovascular disease, and conditions which would predispose patients to hypotension

426 (dehydration, hypovolemia, and treatment with antihypertensive medications) where the  
427 occurrence of syncope, or hypotension and/or bradycardia might put the patient at increased  
428 medical risk.

429 Caution is necessary in patients who receive treatment with other drugs having effects that can  
430 induce hypotension, bradycardia, respiratory or central nervous system depression (*see Drug*  
431 *Interactions*). Concomitant administration of intramuscular olanzapine and parenteral  
432 benzodiazepine has not been studied and is therefore not recommended. If use of intramuscular  
433 olanzapine in combination with parenteral benzodiazepines is considered, careful evaluation of  
434 clinical status for excessive sedation and cardiorespiratory depression is recommended.

435 Seizures — During premarketing testing, seizures occurred in 0.9% (22/2500) of  
436 olanzapine-treated patients. There were confounding factors that may have contributed to the  
437 occurrence of seizures in many of these cases. Olanzapine should be used cautiously in patients  
438 with a history of seizures or with conditions that potentially lower the seizure threshold,  
439 e.g., Alzheimer's dementia. Conditions that lower the seizure threshold may be more prevalent in  
440 a population of 65 years or older.

441 Hyperprolactinemia — As with other drugs that antagonize dopamine D<sub>2</sub> receptors, olanzapine  
442 elevates prolactin levels, and a modest elevation persists during chronic administration. Tissue  
443 culture experiments indicate that approximately one-third of human breast cancers are prolactin  
444 dependent in vitro, a factor of potential importance if the prescription of these drugs is  
445 contemplated in a patient with previously detected breast cancer of this type. Although  
446 disturbances such as galactorrhea, amenorrhea, gynecomastia, and impotence have been reported  
447 with prolactin-elevating compounds, the clinical significance of elevated serum prolactin levels  
448 is unknown for most patients. As is common with compounds which increase prolactin release,  
449 an increase in mammary gland neoplasia was observed in the olanzapine carcinogenicity studies  
450 conducted in mice and rats (*see Carcinogenesis*). However, neither clinical studies nor  
451 epidemiologic studies have shown an association between chronic administration of this class of  
452 drugs and tumorigenesis in humans; the available evidence is considered too limited to be  
453 conclusive.

454 Transaminase Elevations — In placebo-controlled studies, clinically significant ALT (SGPT)  
455 elevations ( $\geq 3$  times the upper limit of the normal range) were observed in 2% (6/243) of patients  
456 exposed to olanzapine compared to none (0/115) of the placebo patients. None of these patients  
457 experienced jaundice. In two of these patients, liver enzymes decreased toward normal despite  
458 continued treatment and in two others, enzymes decreased upon discontinuation of olanzapine. In  
459 the remaining two patients, one, seropositive for hepatitis C, had persistent enzyme elevation for  
460 four months after discontinuation, and the other had insufficient follow-up to determine if  
461 enzymes normalized.

462 Within the larger premarketing database of about 2400 patients with baseline SGPT  $\leq 90$  IU/L,  
463 the incidence of SGPT elevation to  $>200$  IU/L was 2% (50/2381). Again, none of these patients  
464 experienced jaundice or other symptoms attributable to liver impairment and most had transient  
465 changes that tended to normalize while olanzapine treatment was continued.

466 Among 2500 patients in oral olanzapine clinical trials, about 1% (23/2500) discontinued  
467 treatment due to transaminase increases.

468 Caution should be exercised in patients with signs and symptoms of hepatic impairment, in  
469 patients with pre-existing conditions associated with limited hepatic functional reserve, and in  
470 patients who are being treated with potentially hepatotoxic drugs. Periodic assessment of  
471 transaminases is recommended in patients with significant hepatic disease (*see Laboratory Tests*).

472 Potential for Cognitive and Motor Impairment — Somnolence was a commonly reported  
473 adverse event associated with olanzapine treatment, occurring at an incidence of 26% in  
474 olanzapine patients compared to 15% in placebo patients. This adverse event was also dose

475 related. Somnolence led to discontinuation in 0.4% (9/2500) of patients in the premarketing  
476 database.

477 Since olanzapine has the potential to impair judgment, thinking, or motor skills, patients should  
478 be cautioned about operating hazardous machinery, including automobiles, until they are  
479 reasonably certain that olanzapine therapy does not affect them adversely.

480 Body Temperature Regulation — Disruption of the body's ability to reduce core body  
481 temperature has been attributed to antipsychotic agents. Appropriate care is advised when  
482 prescribing olanzapine for patients who will be experiencing conditions which may contribute to  
483 an elevation in core body temperature, e.g., exercising strenuously, exposure to extreme heat,  
484 receiving concomitant medication with anticholinergic activity, or being subject to dehydration.

485 Dysphagia — Esophageal dysmotility and aspiration have been associated with antipsychotic  
486 drug use. Aspiration pneumonia is a common cause of morbidity and mortality in patients with  
487 advanced Alzheimer's disease. Olanzapine and other antipsychotic drugs should be used  
488 cautiously in patients at risk for aspiration pneumonia.

489 Suicide — The possibility of a suicide attempt is inherent in schizophrenia and in bipolar  
490 disorder, and close supervision of high-risk patients should accompany drug therapy.  
491 Prescriptions for olanzapine should be written for the smallest quantity of tablets consistent with  
492 good patient management, in order to reduce the risk of overdose.

493 Use in Patients with Concomitant Illness — Clinical experience with olanzapine in patients  
494 with certain concomitant systemic illnesses (*see* Renal Impairment and Hepatic Impairment  
495 *under* CLINICAL PHARMACOLOGY, Special Populations) is limited.

496 Olanzapine exhibits in vitro muscarinic receptor affinity. In premarketing clinical trials with  
497 olanzapine, olanzapine was associated with constipation, dry mouth, and tachycardia, all adverse  
498 events possibly related to cholinergic antagonism. Such adverse events were not often the basis  
499 for discontinuations from olanzapine, but olanzapine should be used with caution in patients with  
500 clinically significant prostatic hypertrophy, narrow angle glaucoma, or a history of paralytic ileus.

501 In five placebo-controlled studies of olanzapine in elderly patients with dementia-related  
502 psychosis (n=1184), the following treatment-emergent adverse events were reported in  
503 olanzapine-treated patients at an incidence of at least 2% and significantly greater than  
504 placebo-treated patients: falls, somnolence, peripheral edema, abnormal gait, urinary  
505 incontinence, lethargy, increased weight, asthenia, pyrexia, pneumonia, dry mouth and visual  
506 hallucinations. The rate of discontinuation due to adverse events was significantly greater with  
507 olanzapine than placebo (13% vs 7%). Elderly patients with dementia-related psychosis treated  
508 with olanzapine are at an increased risk of death compared to placebo. Olanzapine is not  
509 approved for the treatment of patients with dementia-related psychosis. If the prescriber elects to  
510 treat elderly patients with dementia-related psychosis, vigilance should be exercised (*see* BOX  
511 WARNING and WARNINGS).

512 Olanzapine has not been evaluated or used to any appreciable extent in patients with a recent  
513 history of myocardial infarction or unstable heart disease. Patients with these diagnoses were  
514 excluded from premarketing clinical studies. Because of the risk of orthostatic hypotension with  
515 olanzapine, caution should be observed in cardiac patients (*see* Hemodynamic Effects).

516 For specific information about the precautions of lithium or valproate, refer to the  
517 PRECAUTIONS section of the package inserts for these other products.

## 518 **Information for Patients**

519 Physicians are advised to discuss the following issues with patients for whom they prescribe  
520 olanzapine:

521 Orthostatic Hypotension — Patients should be advised of the risk of orthostatic hypotension,  
522 especially during the period of initial dose titration and in association with the use of

523 concomitant drugs that may potentiate the orthostatic effect of olanzapine, e.g., diazepam or  
524 alcohol (*see* Drug Interactions).

525 Interference with Cognitive and Motor Performance — Because olanzapine has the potential to  
526 impair judgment, thinking, or motor skills, patients should be cautioned about operating  
527 hazardous machinery, including automobiles, until they are reasonably certain that olanzapine  
528 therapy does not affect them adversely.

529 Pregnancy — Patients should be advised to notify their physician if they become pregnant or  
530 intend to become pregnant during therapy with olanzapine.

531 Nursing — Patients should be advised not to breast-feed an infant if they are taking olanzapine.

532 Concomitant Medication — Patients should be advised to inform their physicians if they are  
533 taking, or plan to take, any prescription or over-the-counter drugs, since there is a potential for  
534 interactions.

535 Alcohol — Patients should be advised to avoid alcohol while taking olanzapine.

536 Heat Exposure and Dehydration — Patients should be advised regarding appropriate care in  
537 avoiding overheating and dehydration.

538 Phenylketonurics — ZYPREXA ZYDIS (olanzapine orally disintegrating tablets) contains  
539 phenylalanine (0.34, 0.45, 0.67, or 0.90 mg per 5, 10, 15, or 20 mg tablet, respectively).

#### 540 **Laboratory Tests**

541 Periodic assessment of transaminases is recommended in patients with significant hepatic  
542 disease (*see* Transaminase Elevations).

#### 543 **Drug Interactions**

544 The risks of using olanzapine in combination with other drugs have not been extensively  
545 evaluated in systematic studies. Given the primary CNS effects of olanzapine, caution should be  
546 used when olanzapine is taken in combination with other centrally acting drugs and alcohol.

547 Because of its potential for inducing hypotension, olanzapine may enhance the effects of  
548 certain antihypertensive agents.

549 Olanzapine may antagonize the effects of levodopa and dopamine agonists.

550 The Effect of Other Drugs on Olanzapine — Agents that induce CYP1A2 or glucuronyl  
551 transferase enzymes, such as omeprazole and rifampin, may cause an increase in olanzapine  
552 clearance. Inhibitors of CYP1A2 could potentially inhibit olanzapine clearance. Although  
553 olanzapine is metabolized by multiple enzyme systems, induction or inhibition of a  
554 single enzyme may appreciably alter olanzapine clearance. Therefore, a dosage increase (for  
555 induction) or a dosage decrease (for inhibition) may need to be considered with specific drugs.

556 Charcoal — The administration of activated charcoal (1 g) reduced the C<sub>max</sub> and AUC of oral  
557 olanzapine by about 60%. As peak olanzapine levels are not typically obtained until about  
558 6 hours after dosing, charcoal may be a useful treatment for olanzapine overdose.

559 Cimetidine and Antacids — Single doses of cimetidine (800 mg) or aluminum- and  
560 magnesium-containing antacids did not affect the oral bioavailability of olanzapine.

561 Carbamazepine — Carbamazepine therapy (200 mg bid) causes an approximately 50% increase  
562 in the clearance of olanzapine. This increase is likely due to the fact that carbamazepine is a  
563 potent inducer of CYP1A2 activity. Higher daily doses of carbamazepine may cause an even  
564 greater increase in olanzapine clearance.

565 Ethanol — Ethanol (45 mg/70 kg single dose) did not have an effect on olanzapine  
566 pharmacokinetics.

567 Fluoxetine — Fluoxetine (60 mg single dose or 60 mg daily for 8 days) causes a small  
568 (mean 16%) increase in the maximum concentration of olanzapine and a small (mean 16%)  
569 decrease in olanzapine clearance. The magnitude of the impact of this factor is small in

570 comparison to the overall variability between individuals, and therefore dose modification is not  
571 routinely recommended.

572 Fluvoxamine — Fluvoxamine, a CYP1A2 inhibitor, decreases the clearance of olanzapine.  
573 This results in a mean increase in olanzapine C<sub>max</sub> following fluvoxamine of 54% in female  
574 nonsmokers and 77% in male smokers. The mean increase in olanzapine AUC is 52% and 108%,  
575 respectively. Lower doses of olanzapine should be considered in patients receiving concomitant  
576 treatment with fluvoxamine.

577 Warfarin — Warfarin (20 mg single dose) did not affect olanzapine pharmacokinetics.

578 Effect of Olanzapine on Other Drugs — In vitro studies utilizing human liver microsomes  
579 suggest that olanzapine has little potential to inhibit CYP1A2, CYP2C9, CYP2C19, CYP2D6,  
580 and CYP3A. Thus, olanzapine is unlikely to cause clinically important drug interactions  
581 mediated by these enzymes.

582 Lithium — Multiple doses of olanzapine (10 mg for 8 days) did not influence the kinetics of  
583 lithium. Therefore, concomitant olanzapine administration does not require dosage adjustment of  
584 lithium.

585 Valproate — Studies in vitro using human liver microsomes determined that olanzapine has  
586 little potential to inhibit the major metabolic pathway, glucuronidation, of valproate. Further,  
587 valproate has little effect on the metabolism of olanzapine in vitro. In vivo administration of  
588 olanzapine (10 mg daily for 2 weeks) did not affect the steady state plasma concentrations of  
589 valproate. Therefore, concomitant olanzapine administration does not require dosage adjustment  
590 of valproate.

591 Single doses of olanzapine did not affect the pharmacokinetics of imipramine or its active  
592 metabolite desipramine, and warfarin. Multiple doses of olanzapine did not influence the kinetics  
593 of diazepam and its active metabolite N-desmethyldiazepam, ethanol, or biperiden. However, the  
594 co-administration of either diazepam or ethanol with olanzapine potentiated the orthostatic  
595 hypotension observed with olanzapine. Multiple doses of olanzapine did not affect the  
596 pharmacokinetics of theophylline or its metabolites.

597 Lorazepam — Administration of intramuscular lorazepam (2 mg) 1 hour after intramuscular  
598 olanzapine for injection (5 mg) did not significantly affect the pharmacokinetics of olanzapine,  
599 unconjugated lorazepam, or total lorazepam. However, this co-administration of intramuscular  
600 lorazepam and intramuscular olanzapine for injection added to the somnolence observed with  
601 either drug alone (*see Hemodynamic Effects*).

## 602 **Carcinogenesis, Mutagenesis, Impairment of Fertility**

603 Carcinogenesis — Oral carcinogenicity studies were conducted in mice and rats. Olanzapine  
604 was administered to mice in two 78-week studies at doses of 3, 10, 30/20 mg/kg/day (equivalent  
605 to 0.8-5 times the maximum recommended human daily oral dose on a mg/m<sup>2</sup> basis) and 0.25, 2,  
606 8 mg/kg/day (equivalent to 0.06-2 times the maximum recommended human daily oral dose on a  
607 mg/m<sup>2</sup> basis). Rats were dosed for 2 years at doses of 0.25, 1, 2.5, 4 mg/kg/day (males) and 0.25,  
608 1, 4, 8 mg/kg/day (females) (equivalent to 0.13-2 and 0.13-4 times the maximum recommended  
609 human daily oral dose on a mg/m<sup>2</sup> basis, respectively). The incidence of liver hemangiomas and  
610 hemangiosarcomas was significantly increased in one mouse study in female mice dosed at  
611 8 mg/kg/day (2 times the maximum recommended human daily oral dose on a mg/m<sup>2</sup> basis).  
612 These tumors were not increased in another mouse study in females dosed at 10 or  
613 30/20 mg/kg/day (2-5 times the maximum recommended human daily oral dose on a mg/m<sup>2</sup>  
614 basis); in this study, there was a high incidence of early mortalities in males of the  
615 30/20 mg/kg/day group. The incidence of mammary gland adenomas and adenocarcinomas was  
616 significantly increased in female mice dosed at ≥2 mg/kg/day and in female rats dosed at  
617 ≥4 mg/kg/day (0.5 and 2 times the maximum recommended human daily oral dose on a mg/m<sup>2</sup>  
618 basis, respectively). Antipsychotic drugs have been shown to chronically elevate prolactin levels  
619 in rodents. Serum prolactin levels were not measured during the olanzapine carcinogenicity

620 studies; however, measurements during subchronic toxicity studies showed that olanzapine  
621 elevated serum prolactin levels up to 4-fold in rats at the same doses used in the carcinogenicity  
622 study. An increase in mammary gland neoplasms has been found in rodents after chronic  
623 administration of other antipsychotic drugs and is considered to be prolactin mediated. The  
624 relevance for human risk of the finding of prolactin mediated endocrine tumors in rodents is  
625 unknown (*see* Hyperprolactinemia *under* PRECAUTIONS, General).

626 **Mutagenesis** — No evidence of mutagenic potential for olanzapine was found in the Ames  
627 reverse mutation test, in vivo micronucleus test in mice, the chromosomal aberration test in  
628 Chinese hamster ovary cells, unscheduled DNA synthesis test in rat hepatocytes, induction of  
629 forward mutation test in mouse lymphoma cells, or in vivo sister chromatid exchange test in bone  
630 marrow of Chinese hamsters.

631 **Impairment of Fertility** — In an oral fertility and reproductive performance study in rats, male  
632 mating performance, but not fertility, was impaired at a dose of 22.4 mg/kg/day and female  
633 fertility was decreased at a dose of 3 mg/kg/day (11 and 1.5 times the maximum recommended  
634 human daily oral dose on a mg/m<sup>2</sup> basis, respectively). Discontinuance of olanzapine treatment  
635 reversed the effects on male mating performance. In female rats, the precoital period was  
636 increased and the mating index reduced at 5 mg/kg/day (2.5 times the maximum recommended  
637 human daily oral dose on a mg/m<sup>2</sup> basis). Diestrus was prolonged and estrus delayed at  
638 1.1 mg/kg/day (0.6 times the maximum recommended human daily oral dose on a mg/m<sup>2</sup> basis);  
639 therefore olanzapine may produce a delay in ovulation.

## 640 **Pregnancy**

641 **Pregnancy Category C** — In oral reproduction studies in rats at doses up to 18 mg/kg/day and  
642 in rabbits at doses up to 30 mg/kg/day (9 and 30 times the maximum recommended human daily  
643 oral dose on a mg/m<sup>2</sup> basis, respectively) no evidence of teratogenicity was observed. In an oral  
644 rat teratology study, early resorptions and increased numbers of nonviable fetuses were observed  
645 at a dose of 18 mg/kg/day (9 times the maximum recommended human daily oral dose on a  
646 mg/m<sup>2</sup> basis). Gestation was prolonged at 10 mg/kg/day (5 times the maximum recommended  
647 human daily oral dose on a mg/m<sup>2</sup> basis). In an oral rabbit teratology study, fetal toxicity  
648 (manifested as increased resorptions and decreased fetal weight) occurred at a maternally toxic  
649 dose of 30 mg/kg/day (30 times the maximum recommended human daily oral dose on a mg/m<sup>2</sup>  
650 basis).

651 Placental transfer of olanzapine occurs in rat pups.

652 There are no adequate and well-controlled trials with olanzapine in pregnant females.  
653 Seven pregnancies were observed during clinical trials with olanzapine, including 2 resulting in  
654 normal births, 1 resulting in neonatal death due to a cardiovascular defect, 3 therapeutic  
655 abortions, and 1 spontaneous abortion. Because animal reproduction studies are not always  
656 predictive of human response, this drug should be used during pregnancy only if the potential  
657 benefit justifies the potential risk to the fetus.

## 658 **Labor and Delivery**

659 Parturition in rats was not affected by olanzapine. The effect of olanzapine on labor and  
660 delivery in humans is unknown.

## 661 **Nursing Mothers**

662 In a study in lactating, healthy women, olanzapine was excreted in breast milk. Mean infant  
663 dose at steady state was estimated to be 1.8% of the maternal olanzapine dose. It is recommended  
664 that women receiving olanzapine should not breast-feed.

## 665 **Pediatric Use**

666 Safety and effectiveness in pediatric patients have not been established.

667 **Geriatric Use**

668 Of the 2500 patients in premarketing clinical studies with oral olanzapine, 11% (263) were  
669 65 years of age or over. In patients with schizophrenia, there was no indication of any different  
670 tolerability of olanzapine in the elderly compared to younger patients. Studies in elderly patients  
671 with dementia-related psychosis have suggested that there may be a different tolerability profile  
672 in this population compared to younger patients with schizophrenia. Elderly patients with  
673 dementia-related psychosis treated with olanzapine are at an increased risk of death compared to  
674 placebo. Olanzapine is not approved for the treatment of patients with dementia-related  
675 psychosis. If the prescriber elects to treat elderly patients with dementia-related psychosis,  
676 vigilance should be exercised. Also, the presence of factors that might decrease pharmacokinetic  
677 clearance or increase the pharmacodynamic response to olanzapine should lead to consideration  
678 of a lower starting dose for any geriatric patient (*see* BOX WARNING, WARNINGS,  
679 PRECAUTIONS, *and* DOSAGE AND ADMINISTRATION).

680 **ADVERSE REACTIONS**

681 The information below is derived from a clinical trial database for olanzapine consisting of  
682 8661 patients with approximately 4165 patient-years of exposure to oral olanzapine and  
683 722 patients with exposure to intramuscular olanzapine for injection. This database includes:  
684 (1) 2500 patients who participated in multiple-dose oral olanzapine premarketing trials in  
685 schizophrenia and Alzheimer's disease representing approximately 1122 patient-years of  
686 exposure as of February 14, 1995; (2) 182 patients who participated in oral olanzapine  
687 premarketing bipolar mania trials representing approximately 66 patient-years of exposure;  
688 (3) 191 patients who participated in an oral olanzapine trial of patients having various psychiatric  
689 symptoms in association with Alzheimer's disease representing approximately 29 patient-years  
690 of exposure; (4) 5788 patients from 88 additional oral olanzapine clinical trials as of  
691 December 31, 2001; and (5) 722 patients who participated in intramuscular olanzapine for  
692 injection premarketing trials in agitated patients with schizophrenia, Bipolar I Disorder (manic or  
693 mixed episodes), or dementia. In addition, information from the premarketing 6-week clinical  
694 study database for olanzapine in combination with lithium or valproate, consisting of  
695 224 patients who participated in bipolar mania trials with approximately 22 patient-years of  
696 exposure, is included below.

697 The conditions and duration of treatment with olanzapine varied greatly and included (in  
698 overlapping categories) open-label and double-blind phases of studies, inpatients and outpatients,  
699 fixed-dose and dose-titration studies, and short-term or longer-term exposure. Adverse reactions  
700 were assessed by collecting adverse events, results of physical examinations, vital signs, weights,  
701 laboratory analytes, ECGs, chest x-rays, and results of ophthalmologic examinations.

702 Certain portions of the discussion below relating to objective or numeric safety parameters,  
703 namely, dose-dependent adverse events, vital sign changes, weight gain, laboratory changes, and  
704 ECG changes are derived from studies in patients with schizophrenia and have not been  
705 duplicated for bipolar mania or agitation. However, this information is also generally applicable  
706 to bipolar mania and agitation.

707 Adverse events during exposure were obtained by spontaneous report and recorded by clinical  
708 investigators using terminology of their own choosing. Consequently, it is not possible to provide  
709 a meaningful estimate of the proportion of individuals experiencing adverse events without first  
710 grouping similar types of events into a smaller number of standardized event categories. In the  
711 tables and tabulations that follow, standard COSTART dictionary terminology has been used  
712 initially to classify reported adverse events.

713 The stated frequencies of adverse events represent the proportion of individuals who  
714 experienced, at least once, a treatment-emergent adverse event of the type listed. An event was  
715 considered treatment emergent if it occurred for the first time or worsened while receiving  
716 therapy following baseline evaluation. The reported events do not include those event terms that

717 were so general as to be uninformative. Events listed elsewhere in labeling may not be repeated  
718 below. It is important to emphasize that, although the events occurred during treatment with  
719 olanzapine, they were not necessarily caused by it. The entire label should be read to gain a  
720 complete understanding of the safety profile of olanzapine.

721 The prescriber should be aware that the figures in the tables and tabulations cannot be used to  
722 predict the incidence of side effects in the course of usual medical practice where patient  
723 characteristics and other factors differ from those that prevailed in the clinical trials. Similarly,  
724 the cited frequencies cannot be compared with figures obtained from other clinical investigations  
725 involving different treatments, uses, and investigators. The cited figures, however, do provide the  
726 prescribing physician with some basis for estimating the relative contribution of drug and  
727 nondrug factors to the adverse event incidence in the population studied.

728 **Incidence of Adverse Events in Short-Term, Placebo-Controlled and Combination**  
729 **Trials**

730 The following findings are based on premarketing trials of (1) oral olanzapine for  
731 schizophrenia, bipolar mania, a subsequent trial of patients having various psychiatric symptoms  
732 in association with Alzheimer’s disease, and premarketing combination trials, and  
733 (2) intramuscular olanzapine for injection in agitated patients with schizophrenia or bipolar  
734 mania.

735 **Adverse Events Associated with Discontinuation of Treatment in Short-Term, Placebo-**  
736 **Controlled Trials**

737 Schizophrenia — Overall, there was no difference in the incidence of discontinuation due to  
738 adverse events (5% for oral olanzapine vs 6% for placebo). However, discontinuations due to  
739 increases in SGPT were considered to be drug related (2% for oral olanzapine vs 0% for placebo)  
740 (*see* PRECAUTIONS).

741 Bipolar Mania Monotherapy — Overall, there was no difference in the incidence of  
742 discontinuation due to adverse events (2% for oral olanzapine vs 2% for placebo).

743 Agitation — Overall, there was no difference in the incidence of discontinuation due to adverse  
744 events (0.4% for intramuscular olanzapine for injection vs 0% for placebo).

745 **Adverse Events Associated with Discontinuation of Treatment in Short-Term**  
746 **Combination Trials**

747 Bipolar Mania Combination Therapy — In a study of patients who were already tolerating  
748 either lithium or valproate as monotherapy, discontinuation rates due to adverse events were  
749 11% for the combination of oral olanzapine with lithium or valproate compared to 2% for  
750 patients who remained on lithium or valproate monotherapy. Discontinuations with the  
751 combination of oral olanzapine and lithium or valproate that occurred in more than 1 patient  
752 were: somnolence (3%), weight gain (1%), and peripheral edema (1%).

753 **Commonly Observed Adverse Events in Short-Term, Placebo-Controlled Trials**

754 The most commonly observed adverse events associated with the use of oral olanzapine  
755 (incidence of 5% or greater) and not observed at an equivalent incidence among placebo-treated  
756 patients (olanzapine incidence at least twice that for placebo) were:

757

Common Treatment-Emergent Adverse Events Associated with the Use of Oral Olanzapine in 6-Week Trials — SCHIZOPHRENIA		
Adverse Event	Percentage of Patients Reporting Event	
	Olanzapine (N=248)	Placebo (N=118)
Postural hypotension	5	2

Constipation	9	3
Weight gain	6	1
Dizziness	11	4
Personality disorder <sup>1</sup>	8	4
Akathisia	5	1

<sup>1</sup> Personality disorder is the COSTART term for designating non-aggressive objectionable behavior.

758  
759

Common Treatment-Emergent Adverse Events Associated with the Use of Oral Olanzapine in 3-Week and 4-Week Trials — BIPOLAR MANIA		
Adverse Event	Percentage of Patients Reporting Event	
	Olanzapine (N=125)	Placebo (N=129)
Asthenia	15	6
Dry mouth	22	7
Constipation	11	5
Dyspepsia	11	5
Increased appetite	6	3
Somnolence	35	13
Dizziness	18	6
Tremor	6	3

760

761 There was one adverse event (somnolence) observed at an incidence of 5% or greater among  
762 intramuscular olanzapine for injection-treated patients and not observed at an equivalent  
763 incidence among placebo-treated patients (olanzapine incidence at least twice that for placebo)  
764 during the placebo-controlled premarketing studies. The incidence of somnolence during the  
765 24 hour IM treatment period in clinical trials in agitated patients with schizophrenia or bipolar  
766 mania was 6% for intramuscular olanzapine for injection and 3% for placebo.

767 Adverse Events Occurring at an Incidence of 2% or More Among Oral Olanzapine-  
768 Treated Patients in Short-Term, Placebo-Controlled Trials

769 Table 1 enumerates the incidence, rounded to the nearest percent, of treatment-emergent  
770 adverse events that occurred in 2% or more of patients treated with oral olanzapine (doses  
771  $\geq 2.5$  mg/day) and with incidence greater than placebo who participated in the acute phase of  
772 placebo-controlled trials.

773

**Table 1**  
**Treatment-Emergent Adverse Events:**  
**Incidence in Short-Term, Placebo-Controlled Clinical Trials<sup>1</sup>**  
**with Oral Olanzapine**

Body System/Adverse Event	Percentage of Patients Reporting Event	
	Olanzapine (N=532)	Placebo (N=294)
<b>Body as a Whole</b>		
Accidental injury	12	8
Asthenia	10	9
Fever	6	2
Back pain	5	2

Chest pain	3	1
<b>Cardiovascular System</b>		
Postural hypotension	3	1
Tachycardia	3	1
Hypertension	2	1
<b>Digestive System</b>		
Dry mouth	9	5
Constipation	9	4
Dyspepsia	7	5
Vomiting	4	3
Increased appetite	3	2
<b>Hemic and Lymphatic System</b>		
Ecchymosis	5	3
<b>Metabolic and Nutritional Disorders</b>		
Weight gain	5	3
Peripheral edema	3	1
<b>Musculoskeletal System</b>		
Extremity pain (other than joint)	5	3
Joint pain	5	3
<b>Nervous System</b>		
Somnolence	29	13
Insomnia	12	11
Dizziness	11	4
Abnormal gait	6	1
Tremor	4	3
Akathisia	3	2
Hypertonia	3	2
Articulation impairment	2	1
<b>Respiratory System</b>		
Rhinitis	7	6
Cough increased	6	3
Pharyngitis	4	3
<b>Special Senses</b>		
Amblyopia	3	2
<b>Urogenital System</b>		
Urinary incontinence	2	1
Urinary tract infection	2	1

774 <sup>1</sup> Events reported by at least 2% of patients treated with olanzapine, except the following events which had an  
 775 incidence equal to or less than placebo: abdominal pain, agitation, anorexia, anxiety, apathy, confusion, depression,  
 776 diarrhea, dysmenorrhea<sup>2</sup>, hallucinations, headache, hostility, hyperkinesia, myalgia, nausea, nervousness, paranoid  
 777 reaction, personality disorder<sup>3</sup>, rash, thinking abnormal, weight loss.

778 <sup>2</sup> Denominator used was for females only (olanzapine, N=201; placebo, N=114).

779 <sup>3</sup> Personality disorder is the COSTART term for designating non-aggressive objectionable behavior.

780

781 Commonly Observed Adverse Events in Short-Term Combination Trials

782 In the bipolar mania combination placebo-controlled trials, the most commonly observed  
783 adverse events associated with the combination of olanzapine and lithium or valproate (incidence  
784 of  $\geq 5\%$  and at least twice placebo) were:

785

Common Treatment-Emergent Adverse Events Associated with the Use of Oral Olanzapine in 6-Week Combination Trials — BIPOLAR MANIA		
Adverse Event	Percentage of Patients Reporting Event	
	Olanzapine with lithium or valproate (N=229)	Placebo with lithium or valproate (N=115)
Dry mouth	32	9
Weight gain	26	7
Increased appetite	24	8
Dizziness	14	7
Back pain	8	4
Constipation	8	4
Speech disorder	7	1
Increased salivation	6	2
Amnesia	5	2
Paresthesia	5	2

786

787 Adverse Events Occurring at an Incidence of 2% or More Among Oral Olanzapine-  
788 Treated Patients in Short-Term Combination Trials

789 Table 2 enumerates the incidence, rounded to the nearest percent, of treatment-emergent  
790 adverse events that occurred in 2% or more of patients treated with the combination of  
791 olanzapine (doses  $\geq 5$  mg/day) and lithium or valproate and with incidence greater than lithium or  
792 valproate alone who participated in the acute phase of placebo-controlled combination trials.

793

**Table 2**  
**Treatment-Emergent Adverse Events:**  
**Incidence in Short-Term, Placebo-Controlled Combination Clinical Trials<sup>1</sup>**  
**with Oral Olanzapine**

Body System/Adverse Event	Percentage of Patients Reporting Event	
	Olanzapine with lithium or valproate (N=229)	Placebo with lithium or valproate (N=115)
<b>Body as a Whole</b>		
Asthenia	18	13
Back pain	8	4
Accidental injury	4	2
Chest pain	3	2
<b>Cardiovascular System</b>		
Hypertension	2	1
<b>Digestive System</b>		
Dry mouth	32	9

Increased appetite	24	8
Thirst	10	6
Constipation	8	4
Increased salivation	6	2
<b>Metabolic and Nutritional Disorders</b>		
Weight gain	26	7
Peripheral edema	6	4
Edema	2	1
<b>Nervous System</b>		
Somnolence	52	27
Tremor	23	13
Depression	18	17
Dizziness	14	7
Speech disorder	7	1
Amnesia	5	2
Paresthesia	5	2
Apathy	4	3
Confusion	4	1
Euphoria	3	2
Incoordination	2	0
<b>Respiratory System</b>		
Pharyngitis	4	1
Dyspnea	3	1
<b>Skin and Appendages</b>		
Sweating	3	1
Acne	2	0
Dry skin	2	0
<b>Special Senses</b>		
Amblyopia	9	5
Abnormal vision	2	0
<b>Urogenital System</b>		
Dysmenorrhea <sup>2</sup>	2	0
Vaginitis <sup>2</sup>	2	0

794 <sup>1</sup> Events reported by at least 2% of patients treated with olanzapine, except the following events which had an  
795 incidence equal to or less than placebo: abdominal pain, abnormal dreams, abnormal ejaculation, agitation,  
796 akathisia, anorexia, anxiety, arthralgia, cough increased, diarrhea, dyspepsia, emotional lability, fever, flatulence,  
797 flu syndrome, headache, hostility, insomnia, libido decreased, libido increased, menstrual disorder<sup>2</sup>, myalgia,  
798 nausea, nervousness, pain, paranoid reaction, personality disorder, rash, rhinitis, sleep disorder, thinking abnormal,  
799 vomiting.

800 <sup>2</sup> Denominator used was for females only (olanzapine, N=128; placebo, N=51).

801

802 For specific information about the adverse reactions observed with lithium or valproate, refer  
803 to the ADVERSE REACTIONS section of the package inserts for these other products.

804 Adverse Events Occurring at an Incidence of 1% or More Among Intramuscular  
805 Olanzapine for Injection-Treated Patients in Short-Term, Placebo-Controlled Trials

806 Table 3 enumerates the incidence, rounded to the nearest percent, of treatment-emergent  
807 adverse events that occurred in 1% or more of patients treated with intramuscular olanzapine for

808 injection (dose range of 2.5-10 mg/injection) and with incidence greater than placebo who  
809 participated in the short-term, placebo-controlled trials in agitated patients with schizophrenia or  
810 bipolar mania.  
811

**Table 3**  
**Treatment-Emergent Adverse Events:**  
**Incidence in Short-Term (24 Hour), Placebo-Controlled Clinical Trials**  
**with Intramuscular Olanzapine for Injection**  
**in Agitated Patients with Schizophrenia or Bipolar Mania<sup>1</sup>**

Body System/Adverse Event	Percentage of Patients Reporting Event	
	Olanzapine (N=415)	Placebo (N=150)
<b>Body as a Whole</b>		
Asthenia	2	1
<b>Cardiovascular System</b>		
Hypotension	2	0
Postural hypotension	1	0
<b>Nervous System</b>		
Somnolence	6	3
Dizziness	4	2
Tremor	1	0

812 <sup>1</sup> Events reported by at least 1% of patients treated with olanzapine for injection, except the following events which  
813 had an incidence equal to or less than placebo: agitation, anxiety, dry mouth, headache, hypertension, insomnia,  
814 nervousness.  
815

816 **Additional Findings Observed in Clinical Trials**

817 The following findings are based on clinical trials.

818 **Dose Dependency of Adverse Events in Short-Term, Placebo-Controlled Trials**

819 Extrapyramidal Symptoms — The following table enumerates the percentage of patients with  
820 treatment-emergent extrapyramidal symptoms as assessed by categorical analyses of formal  
821 rating scales during acute therapy in a controlled clinical trial comparing oral olanzapine at  
822 3 fixed doses with placebo in the treatment of schizophrenia.  
823

**TREATMENT-EMERGENT EXTRAPYRAMIDAL SYMPTOMS ASSESSED BY RATING  
SCALES INCIDENCE IN A FIXED DOSAGE RANGE, PLACEBO-CONTROLLED  
CLINICAL TRIAL OF ORAL OLANZAPINE IN SCHIZOPHRENIA — ACUTE PHASE\***

	Percentage of Patients Reporting Event			
	Placebo	Olanzapine 5 ± 2.5 mg/day	Olanzapine 10 ± 2.5 mg/day	Olanzapine 15 ± 2.5 mg/day
Parkinsonism <sup>1</sup>	15	14	12	14
Akathisia <sup>2</sup>	23	16	19	27

824 \* No statistically significant differences.

825 <sup>1</sup> Percentage of patients with a Simpson-Angus Scale total score >3.

826 <sup>2</sup> Percentage of patients with a Barnes Akathisia Scale global score ≥2.  
827

828 The following table enumerates the percentage of patients with treatment-emergent  
829 extrapyramidal symptoms as assessed by spontaneously reported adverse events during acute

830 therapy in the same controlled clinical trial comparing olanzapine at 3 fixed doses with placebo  
831 in the treatment of schizophrenia.  
832

TREATMENT-EMERGENT EXTRAPYRAMIDAL SYMPTOMS ASSESSED BY ADVERSE  
EVENTS INCIDENCE IN A FIXED DOSAGE RANGE, PLACEBO-CONTROLLED  
CLINICAL TRIAL OF ORAL OLANZAPINE IN SCHIZOPHRENIA — ACUTE PHASE

	Percentage of Patients Reporting Event			
	Placebo (N=68)	Olanzapine 5 ± 2.5 mg/day (N=65)	Olanzapine 10 ± 2.5 mg/day (N=64)	Olanzapine 15 ± 2.5 mg/day (N=69)
Dystonic events <sup>1</sup>	1	3	2	3
Parkinsonism events <sup>2</sup>	10	8	14	20
Akathisia events <sup>3</sup>	1	5	11*	10*
Dyskinetic events <sup>4</sup>	4	0	2	1
Residual events <sup>5</sup>	1	2	5	1
Any extrapyramidal event	16	15	25	32*

833 \* Statistically significantly different from placebo.  
834 <sup>1</sup> Patients with the following COSTART terms were counted in this category: dystonia, generalized spasm, neck  
835 rigidity, oculogyric crisis, opisthotonos, torticollis.  
836 <sup>2</sup> Patients with the following COSTART terms were counted in this category: akinesia, cogwheel rigidity,  
837 extrapyramidal syndrome, hypertonia, hypokinesia, masked facies, tremor.  
838 <sup>3</sup> Patients with the following COSTART terms were counted in this category: akathisia, hyperkinesia.  
839 <sup>4</sup> Patients with the following COSTART terms were counted in this category: buccoglossal syndrome,  
840 choreoathetosis, dyskinesia, tardive dyskinesia.  
841 <sup>5</sup> Patients with the following COSTART terms were counted in this category: movement disorder, myoclonus,  
842 twitching.  
843

844 The following table enumerates the percentage of patients with treatment-emergent  
845 extrapyramidal symptoms as assessed by categorical analyses of formal rating scales during  
846 controlled clinical trials comparing fixed doses of intramuscular olanzapine for injection with  
847 placebo in agitation. Patients in each dose group could receive up to three injections during the  
848 trials (*see* CLINICAL PHARMACOLOGY). Patient assessments were conducted during the  
849 24 hours following the initial dose of intramuscular olanzapine for injection. There were no  
850 statistically significant differences from placebo.  
851

TREATMENT-EMERGENT EXTRAPYRAMIDAL SYMPTOMS ASSESSED BY RATING  
SCALES INCIDENCE IN A FIXED DOSE, PLACEBO-CONTROLLED CLINICAL TRIAL  
OF INTRAMUSCULAR OLANZAPINE FOR INJECTION IN AGITATED PATIENTS WITH  
SCHIZOPHRENIA\*

	Percentage of Patients Reporting Event				
	Placebo	Olanzapine IM 2.5 mg	Olanzapine IM 5 mg	Olanzapine IM 7.5 mg	Olanzapine IM 10 mg
Parkinsonism <sup>1</sup>	0	0	0	0	3
Akathisia <sup>2</sup>	0	0	5	0	0

852 \* No statistically significant differences.  
853 <sup>1</sup> Percentage of patients with a Simpson-Angus total score >3.  
854 <sup>2</sup> Percentage of patients with a Barnes Akathisia Scale global score ≥2.  
855

856 The following table enumerates the percentage of patients with treatment-emergent  
857 extrapyramidal symptoms as assessed by spontaneously reported adverse events in the same  
858 controlled clinical trial comparing fixed doses of intramuscular olanzapine for injection with  
859 placebo in agitated patients with schizophrenia. There were no statistically significant differences  
860 from placebo.  
861

TREATMENT-EMERGENT EXTRAPYRAMIDAL SYMPTOMS ASSESSED BY ADVERSE  
EVENTS INCIDENCE IN A FIXED DOSE, PLACEBO-CONTROLLED CLINICAL TRIAL  
OF INTRAMUSCULAR OLANZAPINE FOR INJECTION IN AGITATED PATIENTS WITH  
SCHIZOPHRENIA\*

	Percentage of Patients Reporting Event				
	Placebo (N=45)	Olanzapine IM 2.5 mg (N=48)	Olanzapine IM 5 mg (N=45)	Olanzapine IM 7.5 mg (N=46)	Olanzapine IM 10 mg (N=46)
Dystonic events <sup>1</sup>	0	0	0	0	0
Parkinsonism events <sup>2</sup>	0	4	2	0	0
Akathisia events <sup>3</sup>	0	2	0	0	0
Dyskinetic events <sup>4</sup>	0	0	0	0	0
Residual events <sup>5</sup>	0	0	0	0	0
Any extrapyramidal event	0	4	2	0	0

862 \* No statistically significant differences.

863 <sup>1</sup> Patients with the following COSTART terms were counted in this category: dystonia, generalized spasm, neck  
864 rigidity, oculogyric crisis, opisthotonos, torticollis.

865 <sup>2</sup> Patients with the following COSTART terms were counted in this category: akinesia, cogwheel rigidity,  
866 extrapyramidal syndrome, hypertonia, hypokinesia, masked facies, tremor.

867 <sup>3</sup> Patients with the following COSTART terms were counted in this category: akathisia, hyperkinesia.

868 <sup>4</sup> Patients with the following COSTART terms were counted in this category: buccoglossal syndrome,  
869 choreoathetosis, dyskinesia, tardive dyskinesia.

870 <sup>5</sup> Patients with the following COSTART terms were counted in this category: movement disorder, myoclonus,  
871 twitching.

872

873 Other Adverse Events — The following table addresses dose relatedness for other adverse  
874 events using data from a schizophrenia trial involving fixed dosage ranges of oral olanzapine. It  
875 enumerates the percentage of patients with treatment-emergent adverse events for the  
876 three fixed-dose range groups and placebo. The data were analyzed using the Cochran-Armitage  
877 test, excluding the placebo group, and the table includes only those adverse events for which  
878 there was a statistically significant trend.  
879

Adverse Event	Percentage of Patients Reporting Event			
	Placebo (N=68)	Olanzapine 5 ± 2.5 mg/day (N=65)	Olanzapine 10 ± 2.5 mg/day (N=64)	Olanzapine 15 ± 2.5 mg/day (N=69)
Asthenia	15	8	9	20
Dry mouth	4	3	5	13
Nausea	9	0	2	9
Somnolence	16	20	30	39
Tremor	3	0	5	7

880

881 *Vital Sign Changes* — Oral olanzapine was associated with orthostatic hypotension and  
882 tachycardia in clinical trials. Intramuscular olanzapine for injection was associated with  
883 bradycardia, hypotension, and tachycardia in clinical trials (*see* PRECAUTIONS).

884 *Weight Gain* — In placebo-controlled, 6-week studies, weight gain was reported in 5.6% of  
885 olanzapine patients compared to 0.8% of placebo patients. Olanzapine patients gained an average  
886 of 2.8 kg, compared to an average 0.4 kg weight loss in placebo patients; 29% of olanzapine  
887 patients gained greater than 7% of their baseline weight, compared to 3% of placebo patients. A  
888 categorization of patients at baseline on the basis of body mass index (BMI) revealed a  
889 significantly greater effect in patients with low BMI compared to normal or overweight patients;  
890 nevertheless, weight gain was greater in all 3 olanzapine groups compared to the placebo group.  
891 During long-term continuation therapy with olanzapine (238 median days of exposure), 56% of  
892 olanzapine patients met the criterion for having gained greater than 7% of their baseline weight.  
893 Average weight gain during long-term therapy was 5.4 kg.

894 *Laboratory Changes* — An assessment of the premarketing experience for olanzapine revealed  
895 an association with asymptomatic increases in SGPT, SGOT, and GGT (*see* PRECAUTIONS).  
896 Olanzapine administration was also associated with increases in serum prolactin (*see*  
897 PRECAUTIONS), with an asymptomatic elevation of the eosinophil count in 0.3% of patients,  
898 and with an increase in CPK.

899 Given the concern about neutropenia associated with other psychotropic compounds and the  
900 finding of leukopenia associated with the administration of olanzapine in several animal models  
901 (*see* ANIMAL TOXICOLOGY), careful attention was given to examination of hematologic  
902 parameters in premarketing studies with olanzapine. There was no indication of a risk of  
903 clinically significant neutropenia associated with olanzapine treatment in the premarketing  
904 database for this drug.

905 In clinical trials among olanzapine-treated patients with random triglyceride levels of  
906 <150 mg/dL at baseline (N=659), 0.5% of patients experienced triglyceride levels of ≥500 mg/dL  
907 anytime during the trials. In these same trials, olanzapine-treated patients (N=1185) had a mean  
908 increase of 20 mg/dL in triglycerides from a mean baseline value of 175 mg/dL.

909 In placebo-controlled trials, olanzapine-treated patients with random cholesterol levels of  
910 <200 mg/dL at baseline (N=1034) experienced cholesterol levels of ≥240 mg/dL anytime during  
911 the trials more often than placebo-treated patients (N=602) (3.6% vs 2.2%, respectively). In these  
912 same trials, olanzapine-treated patients (N=2528) had a mean increase of 0.4 mg/dL in  
913 cholesterol from a mean baseline value of 203 mg/dL, which was significantly different  
914 compared to placebo-treated patients (N=1415) with a mean decrease of 4.6 mg/dL from a mean  
915 baseline value of 203 mg/dL.

916 *ECG Changes* — Between-group comparisons for pooled placebo-controlled trials revealed no  
917 statistically significant olanzapine/placebo differences in the proportions of patients experiencing  
918 potentially important changes in ECG parameters, including QT, QTc, and PR intervals.  
919 Olanzapine use was associated with a mean increase in heart rate of 2.4 beats per minute  
920 compared to no change among placebo patients. This slight tendency to tachycardia may be  
921 related to olanzapine's potential for inducing orthostatic changes (*see* PRECAUTIONS).

## 922 **Other Adverse Events Observed During the Clinical Trial Evaluation of** 923 **Olanzapine**

924 Following is a list of terms that reflect treatment-emergent adverse events reported by patients  
925 treated with oral olanzapine (at multiple doses ≥1 mg/day) in clinical trials (8661 patients,  
926 4165 patient-years of exposure). This listing may not include those events already listed in  
927 previous tables or elsewhere in labeling, those events for which a drug cause was remote, those  
928 event terms which were so general as to be uninformative, and those events reported only once or  
929 twice which did not have a substantial probability of being acutely life-threatening.

930 Events are further categorized by body system and listed in order of decreasing frequency  
931 according to the following definitions: frequent adverse events are those occurring in at least  
932 1/100 patients (only those not already listed in the tabulated results from placebo-controlled trials  
933 appear in this listing); infrequent adverse events are those occurring in 1/100 to 1/1000 patients;  
934 rare events are those occurring in fewer than 1/1000 patients.

935 **Body as a Whole** — *Frequent*: dental pain and flu syndrome; *Infrequent*: abdomen enlarged,  
936 chills, face edema, intentional injury, malaise, moniliasis, neck pain, neck rigidity, pelvic pain,  
937 photosensitivity reaction, and suicide attempt; *Rare*: chills and fever, hangover effect, and  
938 sudden death.

939 **Cardiovascular System** — *Frequent*: hypotension; *Infrequent*: atrial fibrillation, bradycardia,  
940 cerebrovascular accident, congestive heart failure, heart arrest, hemorrhage, migraine, pallor,  
941 palpitation, vasodilatation, and ventricular extrasystoles; *Rare*: arteritis, heart failure, and  
942 pulmonary embolus.

943 **Digestive System** — *Frequent*: flatulence, increased salivation, and thirst;  
944 *Infrequent*: dysphagia, esophagitis, fecal impaction, fecal incontinence, gastritis, gastroenteritis,  
945 gingivitis, hepatitis, melena, mouth ulceration, nausea and vomiting, oral moniliasis, periodontal  
946 abscess, rectal hemorrhage, stomatitis, tongue edema, and tooth caries; *Rare*: aphthous  
947 stomatitis, enteritis, eructation, esophageal ulcer, glossitis, ileus, intestinal obstruction, liver fatty  
948 deposit, and tongue discoloration.

949 **Endocrine System** — *Infrequent*: diabetes mellitus; *Rare*: diabetic acidosis and goiter.

950 **Hemic and Lymphatic System** — *Infrequent*: anemia, cyanosis, leukocytosis, leukopenia,  
951 lymphadenopathy, and thrombocytopenia; *Rare*: normocytic anemia and thrombocythemia.

952 **Metabolic and Nutritional Disorders** — *Infrequent*: acidosis, alkaline phosphatase increased,  
953 bilirubinemia, dehydration, hypercholesteremia, hyperglycemia, hyperlipemia, hyperuricemia,  
954 hypoglycemia, hypokalemia, hyponatremia, lower extremity edema, and upper extremity edema;  
955 *Rare*: gout, hyperkalemia, hypernatremia, hypoproteinemia, ketosis, and water intoxication.

956 **Musculoskeletal System** — *Frequent*: joint stiffness and twitching; *Infrequent*: arthritis,  
957 arthrosis, leg cramps, and myasthenia; *Rare*: bone pain, bursitis, myopathy, osteoporosis, and  
958 rheumatoid arthritis.

959 **Nervous System** — *Frequent*: abnormal dreams, amnesia, delusions, emotional lability,  
960 euphoria, manic reaction, paresthesia, and schizophrenic reaction; *Infrequent*: akinesia, alcohol  
961 misuse, antisocial reaction, ataxia, CNS stimulation, cogwheel rigidity, delirium, dementia,  
962 depersonalization, dysarthria, facial paralysis, hypesthesia, hypokinesia, hypotonia,  
963 incoordination, libido decreased, libido increased, obsessive compulsive symptoms, phobias,  
964 somatization, stimulant misuse, stupor, stuttering, tardive dyskinesia, vertigo, and withdrawal  
965 syndrome; *Rare*: circumoral paresthesia, coma, encephalopathy, neuralgia, neuropathy,  
966 nystagmus, paralysis, subarachnoid hemorrhage, and tobacco misuse.

967 **Respiratory System** — *Frequent*: dyspnea; *Infrequent*: apnea, asthma, epistaxis, hemoptysis,  
968 hyperventilation, hypoxia, laryngitis, and voice alteration; *Rare*: atelectasis, hiccup,  
969 hypoventilation, lung edema, and stridor.

970 **Skin and Appendages** — *Frequent*: sweating; *Infrequent*: alopecia, contact dermatitis, dry  
971 skin, eczema, maculopapular rash, pruritus, seborrhea, skin discoloration, skin ulcer, urticaria,  
972 and vesiculobullous rash; *Rare*: hirsutism and pustular rash.

973 **Special Senses** — *Frequent*: conjunctivitis; *Infrequent*: abnormality of accommodation,  
974 blepharitis, cataract, deafness, diplopia, dry eyes, ear pain, eye hemorrhage, eye inflammation,  
975 eye pain, ocular muscle abnormality, taste perversion, and tinnitus; *Rare*: corneal lesion,  
976 glaucoma, keratoconjunctivitis, macular hypopigmentation, miosis, mydriasis, and pigment  
977 deposits lens.

978 **Urogenital System** — *Frequent*: vaginitis\*; *Infrequent*: abnormal ejaculation\*, amenorrhea\*,  
979 breast pain, cystitis, decreased menstruation\*, dysuria, female lactation\*, glycosuria,  
980 gynecomastia, hematuria, impotence\*, increased menstruation\*, menorrhagia\*, metrorrhagia\*,  
981 polyuria, premenstrual syndrome\*, pyuria, urinary frequency, urinary retention, urinary urgency,  
982 urination impaired, uterine fibroids enlarged\*, and vaginal hemorrhage\*; *Rare*: albuminuria,  
983 breast enlargement, mastitis, and oliguria.

984 \* Adjusted for gender.  
985

986 Following is a list of terms that reflect treatment-emergent adverse events reported by patients  
987 treated with intramuscular olanzapine for injection (at one or more doses  $\geq 2.5$  mg/injection) in  
988 clinical trials (722 patients). This listing may not include those events already listed in previous  
989 tables or elsewhere in labeling, those events for which a drug cause was remote, those event  
990 terms which were so general as to be uninformative, and those events reported only once which  
991 did not have a substantial probability of being acutely life-threatening.

992 Events are further categorized by body system and listed in order of decreasing frequency  
993 according to the following definitions: frequent adverse events are those occurring in at least  
994 1/100 patients (only those not already listed in the tabulated results from placebo-controlled trials  
995 appear in this listing); infrequent adverse events are those occurring in 1/100 to 1/1000 patients.

996 **Body as a Whole** — *Frequent*: injection site pain; *Infrequent*: abdominal pain and fever.

997 **Cardiovascular System** — *Infrequent*: AV block, heart block, and syncope.

998 **Digestive System** — *Infrequent*: diarrhea and nausea.

999 **Hemic and Lymphatic System** — *Infrequent*: anemia.

1000 **Metabolic and Nutritional Disorders** — *Infrequent*: creatine phosphokinase increased,  
1001 dehydration, and hyperkalemia.

1002 **Musculoskeletal System** — *Infrequent*: twitching.

1003 **Nervous System** — *Infrequent*: abnormal gait, akathisia, articulation impairment, confusion,  
1004 and emotional lability.

1005 **Skin and Appendages** — *Infrequent*: sweating.

## 1006 **Postintroduction Reports**

1007 Adverse events reported since market introduction that were temporally (but not necessarily  
1008 causally) related to ZYPREXA therapy include the following: allergic reaction  
1009 (e.g., anaphylactoid reaction, angioedema, pruritus or urticaria), diabetic coma, pancreatitis,  
1010 priapism, rhabdomyolysis, and venous thromboembolic events (including pulmonary embolism  
1011 and deep venous thrombosis). Random cholesterol levels of  $\geq 240$  mg/dL and random triglyceride  
1012 levels of  $\geq 1000$  mg/dL have been rarely reported.

## 1013 **DRUG ABUSE AND DEPENDENCE**

### 1014 **Controlled Substance Class**

1015 Olanzapine is not a controlled substance.

### 1016 **Physical and Psychological Dependence**

1017 In studies prospectively designed to assess abuse and dependence potential, olanzapine was  
1018 shown to have acute depressive CNS effects but little or no potential of abuse or physical  
1019 dependence in rats administered oral doses up to 15 times the maximum recommended human  
1020 daily oral dose (20 mg) and rhesus monkeys administered oral doses up to 8 times the maximum  
1021 recommended human daily oral dose on a mg/m<sup>2</sup> basis.

1022 Olanzapine has not been systematically studied in humans for its potential for abuse, tolerance,  
1023 or physical dependence. While the clinical trials did not reveal any tendency for any drug-seeking  
1024 behavior, these observations were not systematic, and it is not possible to predict on the basis of

1025 this limited experience the extent to which a CNS-active drug will be misused, diverted, and/or  
1026 abused once marketed. Consequently, patients should be evaluated carefully for a history of drug  
1027 abuse, and such patients should be observed closely for signs of misuse or abuse of olanzapine  
1028 (e.g., development of tolerance, increases in dose, drug-seeking behavior).

## 1029 **OVERDOSAGE**

### 1030 **Human Experience**

1031 In premarketing trials involving more than 3100 patients and/or normal subjects, accidental or  
1032 intentional acute overdosage of olanzapine was identified in 67 patients. In the patient taking the  
1033 largest identified amount, 300 mg, the only symptoms reported were drowsiness and slurred  
1034 speech. In the limited number of patients who were evaluated in hospitals, including the patient  
1035 taking 300 mg, there were no observations indicating an adverse change in laboratory analytes or  
1036 ECG. Vital signs were usually within normal limits following overdoses.

1037 In postmarketing reports of overdose with olanzapine alone, symptoms have been reported in  
1038 the majority of cases. In symptomatic patients, symptoms with  $\geq 10\%$  incidence included  
1039 agitation/aggressiveness, dysarthria, tachycardia, various extrapyramidal symptoms, and reduced  
1040 level of consciousness ranging from sedation to coma. Among less commonly reported  
1041 symptoms were the following potentially medically serious events: aspiration, cardiopulmonary  
1042 arrest, cardiac arrhythmias (such as supraventricular tachycardia and one patient experiencing  
1043 sinus pause with spontaneous resumption of normal rhythm), delirium, possible neuroleptic  
1044 malignant syndrome, respiratory depression/arrest, convulsion, hypertension, and hypotension.  
1045 Eli Lilly and Company has received reports of fatality in association with overdose of olanzapine  
1046 alone. In one case of death, the amount of acutely ingested olanzapine was reported to be  
1047 possibly as low as 450 mg; however, in another case, a patient was reported to survive an acute  
1048 olanzapine ingestion of 1500 mg.

### 1049 **Overdosage Management**

1050 The possibility of multiple drug involvement should be considered. In case of acute  
1051 overdosage, establish and maintain an airway and ensure adequate oxygenation and ventilation,  
1052 which may include intubation. Gastric lavage (after intubation, if patient is unconscious) and  
1053 administration of activated charcoal together with a laxative should be considered. The  
1054 possibility of obtundation, seizures, or dystonic reaction of the head and neck following overdose  
1055 may create a risk of aspiration with induced emesis. Cardiovascular monitoring should  
1056 commence immediately and should include continuous electrocardiographic monitoring to detect  
1057 possible arrhythmias.

1058 There is no specific antidote to olanzapine. Therefore, appropriate supportive measures should  
1059 be initiated. Hypotension and circulatory collapse should be treated with appropriate measures  
1060 such as intravenous fluids and/or sympathomimetic agents. (Do not use epinephrine, dopamine,  
1061 or other sympathomimetics with beta-agonist activity, since beta stimulation may worsen  
1062 hypotension in the setting of olanzapine-induced alpha blockade.) Close medical supervision and  
1063 monitoring should continue until the patient recovers.

## 1064 **DOSAGE AND ADMINISTRATION**

### 1065 **Schizophrenia**

1066 Usual Dose — Oral olanzapine should be administered on a once-a-day schedule without  
1067 regard to meals, generally beginning with 5 to 10 mg initially, with a target dose of 10 mg/day  
1068 within several days. Further dosage adjustments, if indicated, should generally occur at intervals  
1069 of not less than 1 week, since steady state for olanzapine would not be achieved for  
1070 approximately 1 week in the typical patient. When dosage adjustments are necessary, dose  
1071 increments/decrements of 5 mg QD are recommended.

1072 Efficacy in schizophrenia was demonstrated in a dose range of 10 to 15 mg/day in clinical  
1073 trials. However, doses above 10 mg/day were not demonstrated to be more efficacious than the  
1074 10 mg/day dose. An increase to a dose greater than the target dose of 10 mg/day (i.e., to a dose of  
1075 15 mg/day or greater) is recommended only after clinical assessment. The safety of doses above  
1076 20 mg/day has not been evaluated in clinical trials.

1077 Dosing in Special Populations — The recommended starting dose is 5 mg in patients who are  
1078 debilitated, who have a predisposition to hypotensive reactions, who otherwise exhibit a  
1079 combination of factors that may result in slower metabolism of olanzapine (e.g., nonsmoking  
1080 female patients  $\geq 65$  years of age), or who may be more pharmacodynamically sensitive to  
1081 olanzapine (*see* CLINICAL PHARMACOLOGY; also *see* Use in Patients with Concomitant  
1082 Illness and Drug Interactions *under* PRECAUTIONS). When indicated, dose escalation should  
1083 be performed with caution in these patients.

1084 Maintenance Treatment — While there is no body of evidence available to answer the question  
1085 of how long the patient treated with olanzapine should remain on it, the effectiveness of oral  
1086 olanzapine, 10 mg/day to 20 mg/day, in maintaining treatment response in schizophrenic patients  
1087 who had been stable on ZYPREXA for approximately 8 weeks and were then followed for a  
1088 period of up to 8 months has been demonstrated in a placebo-controlled trial (*see* CLINICAL  
1089 PHARMACOLOGY). Patients should be periodically reassessed to determine the need for  
1090 maintenance treatment with appropriate dose.

## 1091 **Bipolar Disorder**

1092 Usual Monotherapy Dose — Oral olanzapine should be administered on a once-a-day schedule  
1093 without regard to meals, generally beginning with 10 or 15 mg. Dosage adjustments, if indicated,  
1094 should generally occur at intervals of not less than 24 hours, reflecting the procedures in the  
1095 placebo-controlled trials. When dosage adjustments are necessary, dose increments/decrements  
1096 of 5 mg QD are recommended.

1097 Short-term (3-4 weeks) antimanic efficacy was demonstrated in a dose range of 5 mg to  
1098 20 mg/day in clinical trials. The safety of doses above 20 mg/day has not been evaluated in  
1099 clinical trials.

1100 Maintenance Monotherapy — The benefit of maintaining bipolar patients on monotherapy with  
1101 oral ZYPREXA at a dose of 5 to 20 mg/day, after achieving a responder status for an average  
1102 duration of two weeks, was demonstrated in a controlled trial (*see* Clinical Efficacy Data *under*  
1103 CLINICAL PHARMACOLOGY). The physician who elects to use ZYPREXA for extended  
1104 periods should periodically re-evaluate the long-term usefulness of the drug for the individual  
1105 patient.

1106 Bipolar Mania Usual Dose in Combination with Lithium or Valproate — When administered  
1107 in combination with lithium or valproate, oral olanzapine dosing should generally begin with  
1108 10 mg once-a-day without regard to meals.

1109 Short-term (6 weeks) antimanic efficacy was demonstrated in a dose range of 5 mg to  
1110 20 mg/day in clinical trials. The safety of doses above 20 mg/day has not been evaluated in  
1111 clinical trials.

1112 Dosing in Special Populations — *See* Dosing in Special Populations *under* DOSAGE AND  
1113 ADMINISTRATION, Schizophrenia.

### 1114 *Administration of ZYPREXA ZYDIS (olanzapine orally disintegrating tablets)*

1115 After opening sachet, peel back foil on blister. Do not push tablet through foil. Immediately  
1116 upon opening the blister, using dry hands, remove tablet and place entire ZYPREXA ZYDIS in  
1117 the mouth. Tablet disintegration occurs rapidly in saliva so it can be easily swallowed with or  
1118 without liquid.

1119 **Agitation Associated with Schizophrenia and Bipolar I Mania**

1120 Usual Dose for Agitated Patients with Schizophrenia or Bipolar Mania — The efficacy of  
1121 intramuscular olanzapine for injection in controlling agitation in these disorders was  
1122 demonstrated in a dose range of 2.5 mg to 10 mg. The recommended dose in these patients is  
1123 10 mg. A lower dose of 5 or 7.5 mg may be considered when clinical factors warrant (*see*  
1124 CLINICAL PHARMACOLOGY). If agitation warranting additional intramuscular doses persists  
1125 following the initial dose, subsequent doses up to 10 mg may be given. However, the efficacy of  
1126 repeated doses of intramuscular olanzapine for injection in agitated patients has not been  
1127 systematically evaluated in controlled clinical trials. Also, the safety of total daily doses greater  
1128 than 30 mg, or 10 mg injections given more frequently than 2 hours after the initial dose, and  
1129 4 hours after the second dose have not been evaluated in clinical trials. Maximal dosing of  
1130 intramuscular olanzapine (e.g., three doses of 10 mg administered 2-4 hours apart) may be  
1131 associated with a substantial occurrence of significant orthostatic hypotension (*see*  
1132 PRECAUTIONS, Hemodynamic Effects). Thus, it is recommended that patients requiring  
1133 subsequent intramuscular injections be assessed for orthostatic hypotension prior to the  
1134 administration of any subsequent doses of intramuscular olanzapine for injection. The  
1135 administration of an additional dose to a patient with a clinically significant postural change in  
1136 systolic blood pressure is not recommended.

1137 If ongoing olanzapine therapy is clinically indicated, oral olanzapine may be initiated in a range  
1138 of 5-20 mg/day as soon as clinically appropriate (*see* Schizophrenia or Bipolar Disorder *under*  
1139 DOSAGE AND ADMINISTRATION).

1140 Intramuscular Dosing in Special Populations — A dose of 5 mg per injection should be  
1141 considered for geriatric patients or when other clinical factors warrant. A lower dose of 2.5 mg  
1142 per injection should be considered for patients who otherwise might be debilitated, be  
1143 predisposed to hypotensive reactions, or be more pharmacodynamically sensitive to olanzapine  
1144 (*see* CLINICAL PHARMACOLOGY; also *see* Use in Patients with Concomitant Illness and  
1145 Drug Interactions *under* PRECAUTIONS).

1146 *Administration of ZYPREXA IntraMuscular*

1147 ZYPREXA IntraMuscular is intended for intramuscular use only. Do not administer  
1148 intravenously or subcutaneously. Inject slowly, deep into the muscle mass.

1149 Parenteral drug products should be inspected visually for particulate matter and discoloration  
1150 prior to administration, whenever solution and container permit.

1151 *Directions for preparation of ZYPREXA IntraMuscular with Sterile Water for Injection*

1152 Dissolve the contents of the vial using 2.1 mL of Sterile Water for Injection to provide a  
1153 solution containing approximately 5 mg/mL of olanzapine. The resulting solution should appear  
1154 clear and yellow. ZYPREXA IntraMuscular reconstituted with Sterile Water for Injection should  
1155 be used immediately (within 1 hour) after reconstitution. **Discard any unused portion.**

1156 The following table provides injection volumes for delivering various doses of intramuscular  
1157 olanzapine for injection reconstituted with Sterile Water for Injection.

1158

<u>Dose, mg Olanzapine</u>	<u>Volume of Injection, mL</u>
10	Withdraw total contents of vial
7.5	1.5
5	1
2.5	0.5

1159

1160 *Physical Incompatibility Information*

1161 ZYPREXA IntraMuscular should be reconstituted only with Sterile Water for Injection.

1162 ZYPREXA IntraMuscular should not be combined in a syringe with diazepam injection because

1163 precipitation occurs when these products are mixed. Lorazepam injection should not be used to  
1164 reconstitute ZYPREXA IntraMuscular as this combination results in a delayed reconstitution  
1165 time. ZYPREXA IntraMuscular should not be combined in a syringe with haloperidol injection  
1166 because the resulting low pH has been shown to degrade olanzapine over time.

1167 **HOW SUPPLIED**

1168 The ZYPREXA 2.5 mg, 5 mg, 7.5 mg, and 10 mg tablets are white, round, and imprinted in  
1169 blue ink with LILLY and tablet number. The 15 mg tablets are elliptical, blue, and debossed with  
1170 LILLY and tablet number. The 20 mg tablets are elliptical, pink, and debossed with LILLY and  
1171 tablet number. The tablets are available as follows:

1172

	TABLET STRENGTH					
	2.5 mg	5 mg	7.5 mg	10 mg	15 mg	20 mg
Tablet No.	4112	4115	4116	4117	4415	4420
Identification	LILLY 4112	LILLY 4115	LILLY 4116	LILLY 4117	LILLY 4415	LILLY 4420
NDC Codes:						
Bottles 30	NDC 0002- 4112-30	NDC 0002- 4115-30	NDC 0002- 4116-30	NDC 0002- 4117-30	NDC 0002- 4415-30	NDC 0002- 4420-30
Bottles 60	NDC 0002- 4112-60	NDC 0002- 4115-60	NDC 0002- 4116-60	NDC 0002- 4117-60	NDC 0002- 4415-60	NDC 0002- 4420-60
Blisters - ID* 100	NDC 0002- 4112-33	NDC 0002- 4115-33	NDC 0002- 4116-33	NDC 0002- 4117-33	NDC 0002- 4415-33	NDC 0002- 4420-33
Bottles 1000	NDC 0002- 4112-04	NDC 0002- 4115-04	NDC 0002- 4116-04	NDC 0002- 4117-04	NDC 0002- 4415-04	NDC 0002- 4420-04

1173 \* Identi-Dose® (unit dose medication, Lilly).

1174

1175 ZYPREXA ZYDIS (olanzapine orally disintegrating tablets) are yellow, round, and debossed  
1176 with the tablet strength. The tablets are available as follows:

1177

ZYPREXA ZYDIS Tablets*	TABLET STRENGTH			
	5 mg	10 mg	15 mg	20 mg
Tablet No.	4453	4454	4455	4456
Debossed	5	10	15	20
NDC Codes:				
Dose Pack 30 (Child-Resistant)	NDC 0002- 4453-85	NDC 0002- 4454-85	NDC 0002- 4455-85	NDC 0002- 4456-85

1178

1179 ZYPREXA is a registered trademark of Eli Lilly and Company.

1180 ZYDIS is a registered trademark of Cardinal Health, Inc. or one of its subsidiaries.

1181 \*ZYPREXA ZYDIS (olanzapine orally disintegrating tablets) is manufactured for Eli Lilly and  
1182 Company by Cardinal Health, United Kingdom, SN5 8RU.

1183

1184 ZYPREXA IntraMuscular is available in:

1185 NDC 0002-7597-01 (No. VL7597) – 10 mg vial (1s)

1186

1187 Store ZYPREXA tablets, ZYPREXA ZYDIS, and ZYPREXA IntraMuscular vials (before  
1188 reconstitution) at controlled room temperature, 20° to 25°C (68° to 77°F) [see USP].

1189 Reconstituted ZYPREXA IntraMuscular may be stored at controlled room temperature,  
1190 20° to 25°C (68° to 77°F) [*see* USP] for up to 1 hour if necessary. **Discard any unused portion**  
1191 **of reconstituted ZYPREXA IntraMuscular.** The USP defines controlled room temperature as  
1192 a temperature maintained thermostatically that encompasses the usual and customary working  
1193 environment of 20° to 25°C (68° to 77°F); that results in a mean kinetic temperature calculated to  
1194 be not more than 25°C; and that allows for excursions between 15° and 30°C (59° and 86°F) that  
1195 are experienced in pharmacies, hospitals, and warehouses.

1196 Protect ZYPREXA tablets and ZYPREXA ZYDIS from light and moisture. Protect  
1197 ZYPREXA IntraMuscular from light, do not freeze.

#### 1198 **ANIMAL TOXICOLOGY**

1199 In animal studies with olanzapine, the principal hematologic findings were reversible  
1200 peripheral cytopenias in individual dogs dosed at 10 mg/kg (17 times the maximum  
1201 recommended human daily oral dose on a mg/m<sup>2</sup> basis), dose-related decreases in lymphocytes  
1202 and neutrophils in mice, and lymphopenia in rats. A few dogs treated with 10 mg/kg developed  
1203 reversible neutropenia and/or reversible hemolytic anemia between 1 and 10 months of  
1204 treatment. Dose-related decreases in lymphocytes and neutrophils were seen in mice given doses  
1205 of 10 mg/kg (equal to 2 times the maximum recommended human daily oral dose on a mg/m<sup>2</sup>  
1206 basis) in studies of 3 months' duration. Nonspecific lymphopenia, consistent with decreased  
1207 body weight gain, occurred in rats receiving 22.5 mg/kg (11 times the maximum recommended  
1208 human daily oral dose on a mg/m<sup>2</sup> basis) for 3 months or 16 mg/kg (8 times the maximum  
1209 recommended human daily oral dose on a mg/m<sup>2</sup> basis) for 6 or 12 months. No evidence of bone  
1210 marrow cytotoxicity was found in any of the species examined. Bone marrows were  
1211 normocellular or hypercellular, indicating that the reductions in circulating blood cells were  
1212 probably due to peripheral (non-marrow) factors.

1213 Literature revised September 30, 2005

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1215 **Indianapolis, IN 46285, USA**

1216 **[www.ZYPREXA.com](http://www.ZYPREXA.com)**

1217 PV 5194 AMP

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