Study 1 are displayed in Table 10.

is presented in Figure 2.

PHARMACODE READING

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

LEVETIRACETAM injection, for intravenous use Initial U.S. Approval: 1999 RECENT MAJOR CHANGES Indications and Usage (1.1) 10/2019 Dosage and Administration (2.1, 2.8)

- INDICATIONS AND USAGE • Levetiracetam injection is indicated for the treatment of partial-onset seizures in patients 1 month of age and older (1.1) Levetiracetam injection is indicated for adjunctive therapy for the treatment of: • Myoclonic seizures in patients 12 years of age and older with juvenile myoclonic epilepsy (1.2)

 Primary generalized tonic-clonic seizures in patients 6 years of age and older with idiopathic generalized epilepsy (1.3) • Levetiracetam injection is for intravenous use only as an alternative for patients when oral administration is temporarily not feasible (1.4) DOSAGE AND ADMINISTRATION ----

Levetiracetam injection is for intravenous use only (2.1) Partial-Onset Seizures (monotherapy or adjunctive therapy)

1 Month to < 6 Months: 7 mg/kg twice daily; increase by 7 mg/kg twice daily every 2 weeks to recommended dose of • 6 Months to < 4 Years: 10 mg/kg twice daily; increase by 10 mg/kg twice daily every 2 weeks to recommended dose

of 25 mg/kg twice daily (2.1) • 4 Years to < 16 Years: 10 mg/kg twice daily; increase by 10 mg/kg twice daily every 2 weeks to recommended dose of 30 mg/kg twice daily (2.1) • Adults 16 Years and Older: 500 mg twice daily; increase by 500 mg twice daily every 2 weeks to a recommended dose of 1500 mg twice daily (2.1) Myoclonic Seizures in Adults and Pediatric Patients 12 Years and Older

• 500 mg twice daily; increase by 500 mg twice daily every 2 weeks to recommended dose of 1500 mg twice daily (2.2) Primary Generalized Tonic-Clonic Seizures • 6 Years to < 16 Years: 10 mg/kg twice daily; increase by 10 mg/kg twice daily every 2 weeks to recommended dose of 30 mg/kg twice daily (2.3)

. Adults 16 Years and Older: 500 mg twice daily; increase by 500 mg twice daily every 2 weeks to recommended dose of 1500 mg twice daily (2.3)

FULL PRESCRIBING INFORMATION: CONTENTS*

When switching from or to oral levetiracetam, the total daily dosage/frequency of levetiracetam injection should be equivalent to those of oral levetiracetam (2.4, 2.5) See full prescribing information for preparation and administration instructions (2.6) and dosage adjustment in adults with DOSAGE FORMS AND STRENGTHS -----Injection: 500 mg/5 mL single-dose vial (3) - CONTRAINDICATIONS Known hypersensitivity to levetiracetam; angioedema and anaphylaxis have occurred (4, 5.3)

-- WARNINGS AND PRECAUTIONS -Behavioral abnormalities including psychotic symptoms, suicidal ideation, irritability, and aggressive behavior have

been observed; monitor patients for psychiatric signs and symptoms (5.1) Monitor for somnolence and fatigue; advise patients not to drive or operate machinery until they have sufficient experience on levetiracetam (5.2) Serious Dermatological Reactions: Discontinue levetiracetam at the first sign of rash unless clearly not drug related (5.4)

• Coordination Difficulties: Monitor for ataxia, abnormal gait, and incoordination (5.5) Withdrawal Seizures: Levetiracetam must be gradually withdrawn (5.6)

---- ADVERSE REACTIONS Most common adverse reactions (incidence ≥ 5% more than placebo) include: Adults: somnolence, asthenia, infection, and dizziness (6.1)

· Pediatric patients: fatigue, aggression, nasal congestion, decreased appetite, and irritability (6.1) To report SUSPECTED ADVERSE REACTIONS, contact Micro Labs USA, Inc. at 1-855-839-8195 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch

- USE IN SPECIFIC POPULATIONS ---

Pregnancy: Plasma levels of levetiracetam may be decreased; nonitor closely during pregnancy. Based on animal data, may cause fetal harm (5.9, 8.1) See 17 for Patient Counseling Information Revised: 07/2022

6.1 Clinical Trials Experience

1.2 Myoclonic Seizures in Patients with Juvenile Myoclonic Epilepsy 1.3 Primary Generalized Tonic-Clonic Seizures 8.1 Pregnancy 1.4 Limitations of Use 8.2 Lactation 2 DOSAGE AND ADMINISTRATION 8.4 Pediatric Use 8.5 Geriatric Use 2.1 Dosing for Partial-Onset Seizures 2.2 Dosing for Myoclonic Seizures in Patients with Juvenile Myoclonic Epilepsy 8.6 Renal Impairmer 2.3 Dosing for Primary Generalized Tonic-Clonic Seizures 10 OVERDOSAGE

2.4 Switching from Oral Dosing 2.5 Switching to Oral Dosing 2.6 Preparation and Administration Instructions 2.7 Dosage Adjustments in Adult Patients with Renal Impairment 2.8 Discontinuation of Levetiracetam 3 DOSAGE FORMS AND STRENGTHS

INDICATIONS AND USAGE

1.1 Partial-Onset Seizures

1.1 Partial-Onset Seizures

4 CONTRAINDICATIONS 5 WARNINGS AND PRECAUTIONS 5.1 Behavioral Abnormalities and Psychotic Symptoms 5.2 Somnolence and Fatique 5.3 Anaphylaxis and Angioedema 5.4 Serious Dermatological Reactions 5.5 Coordination Difficulties 5.6 Withdrawal Seizures 5.7 Hematologic Abnormalities 5.8 Increase in Blood Pressure

5.9 Seizure Control During Pregnancy FULL PRESCRIBING INFORMATION I INDICATIONS AND USAGE

Levetiracetam is indicated for the treatment of partial-onset seizures in patients 1 month of age and older 1.2 Myoclonic Seizures in Patients with Juvenile Myoclonic Epilepsy
Levetiracetam is indicated as adjunctive therapy for the treatment of myoclonic seizures in patients 12 years of age and older with juvenile myoclonic epilepsy 1.3 Primary Generalized Tonic-Clonic Seizures Levetiracetam is indicated as adjunctive therapy for the treatment of primary generalized tonic-clonic seizures in patients

6 years of age and older with idiopathic generalized epileps 1.4 Limitations of Us Levetiracetam injection is for intravenous use only as an alternative for patients when oral administration is temporarily not 2 DOSAGE AND ADMINISTRATION

2.1 Dosing for Partial-Onset Seizures nded dosing for monotherapy and adjunctive therapy is the same as outlined below. There is no clinical study experience with administration of intravenous levetiracetam for a period longer than 4 days Adults 16 Years of Age and Older

Initiate treatment with a daily dose of 1000 mg/day, given as twice-daily dosing (500 mg twice daily). Additional dosing ncrements may be given (1000 mg/day additional every 2 weeks) to a maximum no evidence that doses greater than 3000 mg/day confer additional benefit. 1 Month to < 6 Months

Initiate treatment with a daily dose of 14 mg/kg in 2 divided doses (7 mg/kg twice daily). Increase the daily dose every 2 weeks by increments of 14 mg/kg to the recommended daily dose of 42 mg/kg (21 mg/kg twice daily). In the clinical trial, the mean daily dose was 35 mg/kg in this age group. 6 Months to < 4 Years Initiate treatment with a daily dose of 20 mg/kg in 2 divided doses (10 mg/kg twice daily). Increase the daily dose in 2 weeks by

an increment of 20 mg/kg to the recommended daily dose of 50 mg/kg (25 mg/kg twice daily). If a patient cannot tolerate a daily dose of 50 mg/kg, the daily dose may be reduced. In the clinical trial, the mean daily dose was 47 mg/kg in this age group. 4 Years to < 16 Years Initiate treatment with a daily dose of 20 mg/kg in 2 divided doses (10 mg/kg twice daily). Increase the daily dose every 2 weeks by increments of 20 mg/kg to the recommended daily dose of 60 mg/kg (30 mg/kg twice daily). If a patient cannot tolerate a

daily dose of 60 mg/kg, the daily dose may be reduced. In the clinical trial, the mean daily dose was 44 mg/kg. The maximum 2.2 Dosing for Myoclonic Seizures in Patients with Juvenile Myoclonic Epilepsy

Initiate treatment with a dose of 1000 mg/day, given as twice-daily dosing (500 mg twice daily). Increase the dosage by 1000 mg/day every 2 weeks to the recommended daily dose of 3000 mg. The effectiveness of doses lower than 3000 mg/day has not 2.3 Dosing for Primary Generalized Tonic-Clonic Seizures Adults 16 Years of Age and Older

Initiate treatment with a dose of 1000 mg/day, given as twice-daily dosing (500 mg twice daily). Increase dosage by 1000 mg/day every 2 weeks to the recommended daily dose of 3000 mg. The effectiveness of doses lower than 3000 mg/day has not Pediatric Patients 6 to <16 Years of Age Initiate treatment with a daily dose of 20 mg/kg in 2 divided doses (10 mg/kg twice daily). Increase the daily dose every 2 weeks

by increments of 20 mg/kg (10 mg/kg twice daily) to the recommended daily dose of 60 mg/kg (30 mg/kg twice daily). The effectiveness of doses lower than 60 mg/kg/day has not been adequately studied. 2.4 Switching from Oral Dosing When switching from oral levetiracetam, the initial total daily intravenous dosage of levetiracetam should be equivalent to the

2.5 Switching to Oral Dosing At the end of the intravenous treatment period, the patient may be switched to levetiracetam oral administration at the equivalent daily dosage and frequency of the intraven 2.6 Preparation and Administration Instructions

Levetiracetam injection is for intravenous use only and should be diluted in 100 mL of a compatible diluent prior to administration. If a smaller volume is required (e.g. pediatric patients), the amount of diluent should be calculated to not exceed a maximum levetiracetam concentration of 15 mg per mL of diluted solution. Consideration should also be given to the total daily fluid intake of the patient. Levetiracetam injection should be administered as a 15-minute IV infusion. One vial of levetiracetam injection contains 500 mg levetiracetam (500 mg/5 mL).

Levetiracetam injection may be mixed with the following diluents and antiepileptic drugs and may be stored in polyviny chloride (PVC) bags. The diluted solution should not be stored for more than 4 hours at controlled room temperature [15 to 30°C (59 to 86°F)].

<u>Diluents:</u> Sodium chloride (0.9%) injection, USP Lactated Ringer's injection Dextrose 5% injection, USI

Other Antiepileptic Drugs: Diazepam Valproate sodium

There are no data to support the physical compatibility of levetiracetam injection with antiepileptic drugs that are not listed Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration whenever solution and container permit. Product with particulate matter or discoloration should not be used. Any unused portion of the levetiracetam injection vial contents should be discarded.

See Table 1 for the recommended preparation and administration of levetiracetam injection for adults to achieve a dose of 500 mg, 1000 mg, or 1500 mg. Table 1: Preparation and Administration of Levetiracetam Injection for Adults

Dose Withdraw Volume Volume of Diluent Infusion Time 500 mg 5 mL (5 mL vial) 15 minutes 100 mL 10 mL (two 5 mL vials) 1500 mg 15 mL (three 5 mL vials) For example, to prepare a 1000 mg dose, dilute 10 mL of levetiracetam injection in 100 mL of a compatible diluent and ously as a 15-minute infusion

When using levetiracetam injection for pediatric patients, dosing is weight-based (mg per kg). The following calculation should be used to determine the appropriate daily dose of levetiracetam injection for pediatric

Total daily dose (mL/day) = Daily dose (mg/kg/day) x patient weight (kg) 2.7 Dosage Adjustments in Adult Patients with Renal Impairment

Levetiracetam dosing must be individualized according to the patient's renal function status. Recommended dosage adjustments for adults with renal impairment are shown in Table 2. Information is unavailable for dosage adjustments in pediatric patients with renal impairment. In order to calculate the dose recommended for adult patients with renal impairment, creatinine clearance adjusted for body surface area must be calculated. To do this an estimate of the patient's creatinine clearance (CLcr) in mL/min must first be calculated using the following formu

CLcr= [140-age (years)] x weight (kg) (x 0.85 for female patients)
72 x serum creatinine (mg/dL)

Then CLcr is adjusted for body surface area (BSA) as follows: CLcr (mL/min/1.73m²)= $\frac{\text{CLcr (mL/min)}}{\text{BSA subject (m²)}}$ x 1.73

Table 2: Dosage Adjustment Regimen for Adult Patients with Renal Impairment Dosage (mg) (mL/min/1.73m²) Normal 500 to 1,500 Every 12 hours > 80 500 to 1.000 50 to 80 Every 12 hours Moderate 30 to 50 250 to 750 Every 12 hours 250 to 500 < 30 Every 12 hours

ESRD patients using dialysis 500 to 1,000¹ Every 24 hours1 1 Following dialysis, a 250 to 500 mg supplemental dose is recommended 2.8 Discontinuation of Levetiracetam Avoid abrupt withdrawal from levetiracetam in order to reduce the risk of increased seizure frequency and status epilepticus

3 DOSAGE FORMS AND STRENGTHS One vial of levetiracetam injection contains 500 mg levetiracetam (500 mg/5 mL). 4 CONTRAINDICATIONS

Isee Warnings and Precautions (5.6)1.

 $Leve tiracetam\ is\ contrain dicated\ in\ patients\ with\ a\ hypersensitivity\ to\ leve tiracetam.\ Reactions\ have\ included\ an aphylaxis\ and$ angioedema [see Warnings and Precautions (5.3)]. 5 WARNINGS AND PRECAUTIONS

5.1 Behavioral Abnormalities and Psychotic Symptoms Levetiracetam may cause behavioral abnormalities and psychotic symptoms. Patients treated with levetiracetam should be monitored for psychiatric signs and symptoms.

Behavioral abnormalities n clinical studies using an oral formulation of levetiracetam, 13% of adult levetiracetam-treated patients and 38% of pediatri levetiracetam-treated patients (4 to 16 years of age), compared to 6% and 19% of adult and pediatric placebo-treated patients. experienced non-psychotic behavioral symptoms (reported as aggression, agitation, anger, anxiety, apathy, depersonalization depression, emotional lability, hostility, hyperkinesias, irritability, nervousness, neurosis, and personality disorder). A randomized, double-blind, placebo-controlled study was performed to assess the neurocognitive and behavioral effects of an oral formulation of levetiracetam as adjunctive therapy in pediatric patients (4 to 16 years of age). The results from an

exploratory analysis indicated a worsening in levetiracetam-treated patients on aggressive behavior (one of eight behavior dimensions), as measured in a standardized and systematic way using a validated instrument, the Achenbach Child Behavior Checklist (CBCL/6 to 18) In clinical studies in pediatric patients 1 month to < 4 years of age, irritability was reported in 12% of the levetiracetam-treated patients compared to 0% of placebo-treated patients In clinical studies, 1.7% of adult levetiracetam-treated patients discontinued treatment due to behavioral adverse reactions. compared to 0.2% of placebo-treated patients. The treatment dose was reduced in 0.8% of adult levetiracetam-tre and in 0.5% of placebo- treated patients. Overall, 11% of levetiracetam-treated pediatric patients experienced behavioral

In clinical studies using an oral formulation of levetiracetam, 1% of levetiracetam-treated adult patients, 2% of levetiracetamreated pediatric patients 4 to 16 years of age, and 17% of levetiracetam-treated pediatric patients 1 month to <4 years of age experienced psychotic symptoms, compared to 0.2%, 2%, and 5% in the corresponding age groups treated with placebo. In a controlled study that assessed the neurocognitive and behavioral effects of an oral formulation of levetiracetam in pediatric patients 4 to 16 years of age, 1.6% of levetiracetam-treated patients experienced paranoia, compared to 0% of placebo-treated patients. In the same study, 3.1% of levetiracetam-treated patients experienced confusional state, compared to 0% of placebotreated patients [see Use in Specific Populations (8.4)].

In clinical studies, two (0.3%) levetiracetam-treated adult patients were hospitalized, and their treatment was discontinued due to psychosis. Both events, reported as psychosis, developed within the first week of treatment and resolved within 1 to 2 weeks following treatment discontinuation. There was no difference between drug- and placebo-treated patients in the incidence of the pediatric patients who discontinued treatment due to psychotic and non-psychotic adverse reactions

Levetiracetam may cause somnolence and fatigue. Patients should be monitored for somnolence and fatigue, and be advised not to drive or operate machinery until they have gained sufficient experience on levetiracetam to gauge whether it adversely affects their ability to drive or operate machinery.

In controlled clinical studies using an oral formulation of levetiracetam in adult patients with partial-onset seizures, 15% of levetiracetam-treated patients reported somnolence, compared to 8% of placebo-treated patients. There was no clear dose response up to 3000 mg/day. In a study in which there was no titration, about 45% of patients receiving levetiracetam 4000 mg/day reported somnolence. The somnolence was considered serious in 0.3% of levetiracetam-treated patients, compared to 1% in the placebo group. About 3% of levetiracetam-treated patients discontinued treatment due to somnolence, compared to 0.7% of placebo-treated patients. In 1.4% of levetiracetam-treated patients and 0.9% of placebo-treated patients, the dose was

In controlled clinical studies using an oral formulation of levetiracetam in adult patients with partial-onset seizures, 15% of evetiracetam-treated patients reported asthenia, compared to 9% of placebo-treated patients. Treatment was discont due to asthenia in 0.8% of levetiracetam-treated patients as compared to 0.5% of placebo-treated patients. In 0.5% of evetiracetam-treated patients and in 0.2% of placebo-treated patients, the dose was reduced due to asthenia Somnolence and asthenia occurred most frequently within the first 4 weeks of treatment. In general, the incidences of somnolence and fatigue in the pediatric partial-onset seizure studies, and in pediatric and adult myoclonic and primary generalized tonic-clonic studies were comparable to those of the adult partial-onset seizure studies.

5.3 Anaphylaxis and Angioedema Levetiracetam can cause anaphylaxis or angioedema after the first dose or at any time during treatment. Signs and symptoms $n\,cases\,reported\,in\,the\,post marketing\,setting\,have\,included\,hypotension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hipportension,\,hives,\,rash,\,respiratory\,distress,\,and\,swelling\,of\,the\,hipportension,\,hippo$ face, lip, mouth, eye, tongue, throat, and feet. In some reported cases, reactions were life-threatening and required emergency treatment. If a patient develops signs or symptoms of anaphylaxis or angioedema, levetiracetam should be discontinued and the patient should seek immediate medical attention. Levetiracetam should be discontinued permanently if a clear alternative

etiology for the reaction cannot be established [see Contraindications (4)]. 5.4 Serious Dermatological Reactions Serious dermatological reactions, including Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN), have been reported in both pediatric and adult patients treated with levetiracetam. The median time of onset is reported to be 14 to 17 days, but cases have been reported at least four months after initiation of treatment. Recurrence of the serious skin reactions following rechallenge with levetiracetam has also been reported. Levetiracetam should be discontinued at the first sign of a rash, unless the rash is clearly not drug-related. If signs or symptoms suggest SJS/TEN, use of this drug should not be

resumed and alternative therapy should be considered.

5.5 Coordination Difficulties Levetiracetam may cause coordination difficulties In controlled clinical studies using an oral formulation of levetiracetam in adult patients with partial-onset seizures, 3.4% of evetiracetam-treated patients experienced coordination difficulties, (reported as ataxia, abnormal gait, or incoordin compared to 1.6% of placebo-treated patients. A total of 0.4% of patients in controlled clinical studies discontinued levetiracetam treatment due to ataxia, compared to 0% of placebo-treated patients. In 0.7% of levetiracetam-treated patients and in 0.2% of placebo-treated patients, the dose was reduced due to coordination difficulties, while one of the treated patients was hospitalized due to worsening of pre-existing ataxia. These events occurred most frequently within the first 4 weeks of

Patients should be monitored for signs and symptoms of coordination difficulties and advised not to drive or operate nachinery until they have gained sufficient experience on levetiracetam to gauge whether it could adversely affect their ability to drive or operate machinery. 5.6 Withdrawal Seizures As with most antiepileptic drugs, levetiracetam should generally be withdrawn gradually because of the risk of increased seizure frequency and status epilepticus. But if withdrawal is needed because of a serious adverse reaction, rapid

5.7 Hematologic Abnormalities Levetiracetam can cause hematologic abnormalities. Hematologic abnormalities occurred in clinical trials and included decreases in white blood cell (WBC), neutrophil, and red blood cells counts (RBC); decreases in hemoglobin and hematocrit; and increases in eosinophil counts. Cases of agranulocytosis, pancytopenia, and thrombocytopenia have been reported in the postmarketing setting. A complete blood count is recommended in patients experiencing significant weakness, pyrexia,

Partial-Onset Seizures n controlled clinical studies using an oral formulation of levetiracetam in adult patients with partial-onset seizures, minor but statistically significant decreases compared to placebo in total mean RBC (0.03 x 10⁶/mm³), mean hemoglobin (0.09 g/dL), and mean hematocrit (0.38%), were seen in levetiracetam-treated patients. A total of 3.2% of levetiracetam-treated and 1.8% of placebo-treated patients had at least one possibly significant (≤2.8 x 10°/L) decreased WBC, and 2.4% of levetiracetam-treated and 1.4% of placebo-treated patients had at least one possibly significant

(≤1.0 x 10°/L) decreased neutrophil count. Of the levetiracetam-treated patients with a low neutrophil count, all but one rose

towards or to baseline with continued treatment. No patient was discontinued secondary to low neutrophil counts Pediatric Patients 4 Years to < 16 Years In a controlled study in pediatric patients age 4 years to <16 years, statistically significant decreases in WBC and neutrophil counts were seen in levetiracetam-treated patients, as compared to placebo. The mean decreases from baseline in the levetiracetam-treated group were $-0.4 \times 10^9/L$ and $-0.3 \times 10^9/L$, respectively, whereas there were small increases in the placebo group. Mean relative lymphocyte counts increased by 1.7% in levetiracetam-treated patients, compared to a decrease of 4% in placebo-treated patients (statistically significant). More levetiracetam-treated patients had a possibly clinically significant abnormally low WBC value (3% of levetiracetam-

with respect to neutrophil count (5% on levetiracetam versus 4.2% on placebo). No patient was discontinued because of low In a randomized, double-blind, placebo-controlled study to assess the neurocognitive and behavioral effects of an oral

6 ADVERSE REACTIONS

Switching From or To Oral Levetiracetam

6.2 Postmarketing Experience 8 USE IN SPECIFIC POPULATIONS

10.1 Signs, Symptoms and Laboratory Findings of Acute Overdosage in Humans 10.2 Management of Overdose 10.3 Hemodialysis

11 DESCRIPTION 12 CLINICAL PHARMACOLOGY 12.1 Mechanism of Action 12.2 Pharmacodynamics 12.3 Pharmacokinetics 13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility 14 CLINICAL STUDIES 14.1 Partial-Onset Seizures 14.2 Myoclonic Seizures in Patients with Juvenile Myoclonic Epilepsy

14.3 Primary Generalized Tonic-Clonic Seizures 16 HOW SUPPLIED/STORAGE AND HANDLING 16.1 How Supplied 16.2 Storage

17 PATIENT COUNSELING INFORMATION * Sections or subsections omitted from the Full Prescribing Information are not listed. formulation of levetiracetam as adjunctive therapy in pediatric patients (4 to 16 years of age), 5 patients (8.6%) in the

levetiracetam-treated group and two patients (6.1%) in the placebo-treated group had high eosinophil count values that were possibly clinically significant (≥10% or ≥0.7X10°/L). 5.8 Increase in Blood Pressure In a randomized, placebo-controlled study in patients 1 month to <4 years of age using an oral formulation of levetiracetam, a significantly higher risk of increased diastolic blood pressure was observed in the levetiracetam-treated patients (17%),

compared to placebo-treated patients (2%). There was no overall difference in mean diastolic blood pressure between the reatment groups. This disparity between the levetiracetam and placebo treatment groups was not observed in the studies of older children or in adults. Monitor patients 1 month to <4 years of age for increases in diastolic blood pressure 5.9 Seizure Control During Pregnancy siological changes may gradually decrease plasma levels of levetiracetam throughout pregnancy. This decrease is more

pronounced during the third trimester. It is recommended that patients be monitored carefully during pregnancy. Close monitoring should continue through the postpartum period especially if the dose was changed during pregnancy

The following adverse reactions are discussed in more details in other sections of labeling:

Behavioral Abnormalities and Psychotic Symptoms [see Warnings and Precautions (5.1)] Somnolence and Fatigue [see Warnings and Precautions (5.2)]
Anaphylaxis and Angioedema [see Warnings and Precautions (5.3)]

Serious Dermatological Reactions [see Warnings and Precautions (5.4)] Coordination Difficulties [see Warnings and Precautions (5.5)] Hematologic Abnormalities [see Warnings and Precautions (5.7)] Increase in Blood Pressure (see Warnings and Precautions (5.8)

6.1 Clinical Trials Experience Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice. The adverse reactions that result from levetiracetam injection use include all of those reported for levetiracetam tablets and oral solution. Equivalent doses of intravenous (IV) levetiracetam and oral levetiracetam result in equivalent C_{max} , C_{min} and total systemic exposure to levetiracetam when the IV levetiracetam is administered as a 15-minute infusion

Partial-Onset Seizures In controlled clinical studies using levetiracetam tablets in adults with partial-onset seizures [see Clinical Studies (14.1)], the most common adverse reactions in adult patients receiving levetiracetam in combination with other AEDs, for events with rates greater than placebo, were somnolence, asthenia, infection, and dizziness. Of the most common adverse reactions in adults experiencing partial-onset seizures, asthenia, somnolence, and dizziness occurred predominantly during the first 4 weeks of treatment with levetiracetam.

Table 3 lists adverse reactions that occurred in at least 1% of adult epilepsy patients receiving levetiracetam tablets in placebo-controlled studies and were numerically more common than in patients treated with placebo. In these studies, either levetiracetam or placebo was added to concurrent AED therapy Table 3: Adverse Reactions* in Pooled Placebo-Controlled, Adjunctive Studies in Adults Experiencing Partial-Onset Seizures

	Levetiracetam (N=769)	Placebo (N=439)
	%	%
Asthenia	15	9
Somnolence	15	8
Headache	14	13
Infection	13	8
Dizziness	9	4
Pain	7	6
Pharyngitis	6	4
Depression	4	2
Nervousness	4	2
Rhinitis	4	3
Anorexia	3	2
Ataxia	3	1
Vertigo	3	1
Amnesia	2	1
Anxiety	2	1
Cough Increased	2	1
Diplopia	2	1
Emotional Lability	2	0
Hostility	2	1
Paresthesia	2	1
Sinusitis	2	1

In controlled adult clinical studies using levetiracetam tablets, 15% of patients receiving levetiracetam and 12% receiving placebo either discontinued or had a dose reduction as a result of an adverse reaction. Table 4 lists the most common (>1%) adverse reactions that resulted in discontinuation or dose reduction and that occurred more frequently in levetiracetam-treater patients than in placebo-treated patients.

	Levetiracetam	Placebo
dverse Reaction	(N=769)	(N=439)
	%	%
Somnolence	4	2
Dizziness	1	0

using an oral formulation in pediatric patients 4 to 16 years of age with partial-onset seizures. The most common adverse reactions in pediatric patients receiving levetiracetam in combination with other AEDs, for events with rates greater than placebo, were fatigue, aggression, nasal congestion, decreased appetite, and irritability. Table 5 lists adverse reactions from the pooled pediatric controlled studies (4 to 16 years of age) that occurred in at least 2% of these studies, either levetiracetam or placebo was added to concurrent AED therapy. Table 5: Adverse Reactions* in Pooled Placebo-Controlled, Adjunctive Studies in Pediatric Patients Ages 4 to 16 Years

Experiencing Partial-Onset Seizures

The adverse reaction data presented below was obtained from a pooled analysis of two controlled pediatric clinical studies

	(N=165) %	(N=131) %
Handarka.	•	,-
Headache	19	15
Nasopharyngitis	15	12
Vomiting	15	12
Somnolence	13	9
Fatigue	11	5
Aggression	10	5
Abdominal Pain Upper	9	8
Cough	9	5
Nasal Congestion	9	2
Decreased Appetite	8	2
Abnormal Behavior	7	4
Dizziness	7	5
Irritability	7	1
Pharyngolaryngeal Pain	7	4
Diarrhea	6	2
Lethargy	6	5
Insomnia	5	3
Agitation	4	1
Anorexia	4	3
Head Injury	4	0
Constipation	3	1
Contusion	3	1
Depression	3	1
Fall	3	2
Influenza	3	1
Mood Altered	3	1
Affect Lability	2	1
Anxiety	2	1
Arthralgia	2	0
Confusional State	2	0
Conjunctivitis	2	0
Ear Pain	2	1
Gastroenteritis	2	0
Joint Sprain	2	1
Mood Swings	2	1
Neck Pain	2	1
Rhinitis	2	0
Sedation	2	1

*Adverse reactions occurred in at least 2% of pediatric levetiracetam -treated patients and occurred more frequently than In the controlled pooled pediatric clinical studies in patients 4 to 16 years of age, 7% of patients receiving levetiracetam and 9%receiving placebo discontinued as a result of an adverse reaction. Pediatric Patients 1 Month to < 4 Years

 $In the 7-day \ controlled \ pediatric \ clinical \ study \ using \ an \ or alformulation \ of \ levetirac \ etam \ in \ children \ 1 \ month \ to \ less \ than \ 4 \ years$ of age with partial-onset seizures, the most common adverse reactions in patients receiving levetiracetam in combination wit other AEDs, for events with rates greater than placebo, were somnolence and irritability. Because of the shorter exposure period, incidences of adverse reactions are expected to be lower than in other pediatric studies in older patients. Therefore, other controlled pediatric data, presented above, should also be considered to apply to this age group. $Table \ 6 \ lists \ adverse \ reactions \ that \ occurred \ in \ at \ least \ 5\% \ of \ pedia tric \ epilepsy \ patients \ (ages \ 1 \ month \ to < 4 \ years) \ treated \ with$ levetiracetam in the placebo-controlled study and were numerically more common than in patients treated with placebo. In this

study, either levetiracetam or placebo was added to concurrent AED therapy. Table 6: Adverse Reactions* in a Placebo-Controlled, Adjunctive Study in Pediatric Patients Ages 1 Month to < 4 Years Experiencing Partial-Onset Seizures (N=56)Somnolence Irritability *Adverse reactions occurred in at least 5% of levetiracetam-treated patients and occurred more frequently than placebo

In the 7-day controlled pediatric clinical study in patients 1 month to < 4 years of age, 3% of patients receiving levetiracetam and 2% receiving placebo either discontinued or had a dose reduction as a result of an adverse reaction. There was no adverse reaction that resulted in discontinuation for more than one patient Myoclonic Seizures

ough the pattern of adverse reactions in this study seems somewhat different from that seen in patients with partial-onse

treated patients

seizures, this is likely due to the much smaller number of patients in this study compared to partial seizure studies. The adverse $reaction\ pattern\ for\ patients\ with\ JME\ is\ expected\ to\ be\ essentially\ the\ same\ as\ for\ patients\ with\ partial\ seizures.$ In the controlled clinical study using levetiracetam tablets in patients with myoclonic seizures [see Clinical Studies (14.2)], the most common adverse reactions in patients receiving levetiracetam in combination with other AEDs, for events with rates greater than placebo, were somnolence, neck pain, and pharyngitis. Table 7 lists adverse reactions that occurred in at least 5% of juvenile myoclonic epilepsy patients experiencing myoclonic

seizures treated with levetiracetam tablets and were numerically more common than in patients treated with placebo. In this study, either levetiracetam or placebo was added to concurrent AED therapy. Table 7: Adverse Reactions* in a Placebo-Controlled, Adjunctive Study in Patients 12 Years of Age and Older with

	Levetiracetam (N=60)	Placebo (N=60)
	%	%
Somnolence	12	2
Neck pain	8	2
Pharyngitis	7	0
Depression	5	2
nfluenza	5	2
Vertigo	5	3

In the placebo-controlled study using levetiracetam tablets in patients with JME, 8% of patients receiving levetiracetam and 2% receiving placebo either discontinued or had a dose reduction as a result of an adverse reaction. The adverse reactions that led to discontinuation or dose reduction and that occurred more frequently in levetiracetam-treated patients than in placeboreated patients are presented in Table 8.

Table 8: Adverse Reactions that Resulted in Discontinuation or Dose Reduction in Patients with Juvenile Myoclonic

Adverse Reaction	Levetiracetam (N=60)	Placebo (N=60)
	%	%
Anxiety	3	2
Depressed mood	2	0
Depression	2	0
Diplopia	2	0
Hypersomnia	2	0
Insomnia	2	0
Irritability	2	0
Nervousness	2	0
Somnolence	2	0

Although the pattern of adverse reactions in this study seems somewhat different from that seen in patients with partial seizures, this is likely due to the much smaller number of patients in this study compared to partial seizure studies. The adverse reaction pattern for patients with primary generalized tonic-clonic (PGTC) seizures is expected to be essentially the same as for patients with partial seizures. In the controlled clinical study that included patients 4 years of age and older with PGTC seizures, the most common advers reaction in patients receiving levetiracetam oral formulation in combination with other AEDs, for events with rates greater than $Table \ 9 \ lists \ adverse \ reactions \ that \ occurred \ in \ at \ least \ 5\% \ of \ idiopathic \ generalized \ epilepsy \ patients \ experiencing \ PGTC$ seizures treated with levetiracetam and were numerically more common than in patients treated with placebo. In this study, either levetiracetam or placebo was added to concurrent AED therapy.

Table 9: Adverse Reactions* in a Placebo-Controlled, Adjunctive Study in Patients 4 Years of Age and Older with PGTC

Levetiracetan **Adverse Reaction** (N=60)Nasopharyngitis Fatigue Diarrhea Irritability

Mood swings *Adverse reactions occurred in at least 5% of levetiracetam-treated patients and occurred more frequently than placebotreated patients In the placebo-controlled study, 5% of patients receiving levetiracetam and 8% receiving placebo either discontinued or had a se reduction during the treatment period as a result of an adverse reactio This study was too small to adequately characterize the adverse reactions that could be expected to result in discontinuation of

97

treatment in this population. It is expected that the adverse reactions that would lead to discontinuation in this population would In addition, the following adverse reactions were seen in other controlled adult studies of Levetiracetam: balance disorder, disturbance in attention, eczema, memory impairment, myalgia, and blurred vision.

Comparison of Gender, Age and Race The overall adverse reaction profile of levetiracetam was similar between females and males. There are insufficient data to support a statement regarding the distribution of adverse reactions by age and race. 6.2 Postmarketing Experience

The following adverse reactions have been identified during postapproval use of levetiracetam. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure. The following adverse reactions have been reported in patients receiving levetiracetam worldwide. The listing is alphabetized: abnormal liver function test, acute kidney injury, anaphylaxis, angioedema, agranulocytosis, choreoathetosis, drug reaction with eosinophilia and systemic symptoms (DRESS), dyskinesia, erythema multiforme, hepatic failure, hepatitis, hyponatremia,

muscular weakness, pancreatitis, pancytopenia (with bone marrow suppression identified in some of these cases), panic attack, thrombocytopenia, weight loss, and worsening of seizures. Alopecia has been reported with levetiracetam use; recovery was observed in majority of cases where levetiracetam was discontinued. 8 USE IN SPECIFIC POPULATIONS

Pregnancy Exposure Registry There is a pregnancy exposure registry that monitors pregnancy outcomes in women exposed to antiepileptic drugs (AEDs), including levetiracetam, during pregnancy. Encourage women who are taking levetiracetam during pregnancy to enroll in the North American Antiepileptic Drug (NAAED) pregnancy registry by calling 1-888-233-2334 or visiting http://www.aedpregnancyregistry.org/.

Prolonged experience with levetiracetam in pregnant women has not identified a drug-associated risk of major birth defects or miscarriage, based on published literature, which includes data from pregnancy registries, and reflects experience over two decades [see Human Data]. In animal studies, levetiracetam produced developmental toxicity (increased embryofetal and offspring mortality, increased incidences of fetal structural abnormalities, decreased embryofetal and offspring growth, neurobehavioral alterations in offspring) at doses similar to human therapeutic doses [see Animal Data]. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized $\frac{1}{2}$

pregnancies is 2 to 4% and 15 to 20%, respectively. The background risk of major birth defects and miscarriage for the Clinical Considerations Levetiracetam blood levels may decrease during pregnancy [see Warnings and Precautions (5.9)]. Physiological changes during pregnancy may affect levetiracetam concentration. Decrease in levetiracetam plasma concentrations has been observed during pregnancy. This decrease is more pronounced during the third trimester. Dose adjustments may be necessary to maintain clinical response

Human Data While available studies cannot definitively establish the absence of risk, data from the published literature and pregnancy registries have not established an association with levetiracetam use during pregnancy and major birth defects or miscarriage When levetiracetam (0, 400, 1200, or 3600 mg/kg/day) was administered orally to pregnant rats during the period of organogenesis, reduced fetal weights and increased incidence of fetal skeletal variations were observed at the highest dose tested. There was no evidence of maternal toxicity. The no-effect dose for adverse effects on embryofetal developmental in rats

(1200 mg/kg/day) is approximately 4 times the maximum recommended human dose (MRHD) of 3000 mg on a body surface

Oral administration of levetiracetam (0, 200, 600, or 1800 mg/kg/day) to pregnant rabbits during the period of organogenesis resulted in increased embryofetal mortality and incidence of fetal skeletal variations at the mid and high dose and decreased fetal weights and increased incidence of fetal malformations at the high dose, which was associated with maternal toxicity. The no-effect dose for adverse effects on embryofetal development in rabbits (200 mg/kg/day) is approximately equivalent to the MRHD on a mg/m² basis. Oral administration of levetiracetam (0, 70, 350, or 1800 mg/kg/day) to female rats throughout pregnancy and lactation led to an increased incidence of fetal skeletal variations, reduced fetal body weight, and decreased growth in offspring at the mid and high doses and increased pup mortality and neurobehavioral alterations in offspring at the highest dose tested. There was no evidence of maternal toxicity. The no-effect dose for adverse effects on pre-and postnatal devi is less than the MRHD on a mg/m2 basis.

8.2 Lactation Risk Summary Levetiracetam is excreted in human milk. There are no data on the effects of levetiracetam on the breastfed infant, or the effects on milk production The developmental and health benefits of breastfeeding should be considered along

Oral administration of levetiracetam to rats during the latter part of gestation and throughout lactation produced no adverse

with the mother's clinical need for levetiracetam and any potential adverse effects on the breastfed infant from levetiracetam or from the underlying maternal condition. 8.4 Pediatric Use The safety and effectiveness of levetiracetam for the treatment of partial-onset seizures in patients 1 month to 16 years of age have been established [see Clinical

and Administration (2.6)].

The safety and effectiveness of levetiracetam as adjunctive therapy for the treatment of myoclonic seizures in adolescents 12 years of age and older with juvenile myoclonic epilepsy have been established [see Clinical Studies (14.2)]. The safety and effectiveness of levetiracetam as adjunctive therapy for the treatment of primary generalized tonic-clonic seizures in pediatric patients 6 years of age and older with idiopathic generalized epilepsy have been Studies (14.3)]. Safety and effectiveness for the treatment of partial-onset seizures in pediatric patients below the age of 1 month; adjunctive therapy for the treatment of myoclonic seizures in pediatric patients below the age of 12 years; and adjunctive therapy for the treatment of primary generalized tonic-clonic seizures in pediatric patients below the age of 6 years have not been established. A 3-month, randomized, double-blind, placebo-controlled study was performed to assess the neurocognitive and behavioral effects of levetiracetam as adjunctive therapy in 98 (levetiracetam N=64, placebo N=34) pediatric patients, ages 4 years to 16 years, with partial seizures that were inadequately controlled. The target dose was 60 mg/kg/day. Neurocognitive effects were measured by the Leiter-R Attention and Memory (AM) Battery, which measures various aspects of a child's memory and

Pharmacology (12.3) and Clinical Studies (14.1)1. The dosing recommendation in

these pediatric patients varies according to age group and is weight-based [see Dosage

on average, a worsening in levetiracetam-treated patients in aggressive behavior, one of the eight syndrome scores

attention. Although no substantive differences were observed between the placebo and drug treated groups in the median change from baseline in this battery, the study was not adequate to assess formal statistical non-inferiority of the drug and

placebo. The Achenbach Child Behavior Checklist (CBCL/6 to 18), a standardized validated tool used to assess a child's

competencies and behavioral/emotional problems, was also assessed in this study. An analysis of the CBCL/6 to 18 indicated

Studies of levetiracetam in juvenile rats (dosed on postnatal days 4 through 52) and dogs (dosed from postnatal weeks 3 through 7) at doses of up to 1800 mg/kg/day (approximately 7 and 24 times, respectively, the maximum recommended pediatric dose of 60 mg/kg/day on a mg/m2 basis) did not demonstrate adverse effects on postnatal development. 8.5 Geriatric Use here were 347 subjects in clinical studies of levetiracetam that were 65 years old and over. No overall diffe observed between these subjects and younger subjects. There were insufficient numbers of elderly subjects in controlled trials of epilepsy to adequately assess the effectiveness of levetiracetam in these patients. Levetiracetam is known to be substantially excreted by the kidney, and the risk of adverse reactions to this drug may be greater

be taken in dose selection, and it may be useful to monitor renal function [see Clinical Pharmacology (12.3)]. 8.6 Renal Impairment Clearance of levetiracetam is decreased in patients with renal impairment and is correlated with creatinine clearance [see Clinical Pharmacology (12.3)]. Dosage adjustment is recommended for patients with impaired renal function and supplemental doses should be given to patients after dialysis [see Dosage and Administration (2.7)].

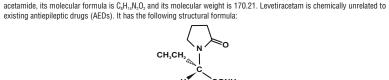
in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should

10 OVERDOSAGE 10.1 Signs, Symptoms and Laboratory Findings of Acute Overdosage in Humans The highest known dose of oral levetiracetam received in the clinical development program was 6000 mg/day. Other than drowsiness, there were no adverse reactions in the few known cases of overdose in clinical trials. Cases of somnolence, agitation, aggression, depressed level of consciousness, respiratory depression, and coma were observed with levetiracetam overdoses in postmarketing use.

10.2 Management of Overdose There is no specific antidote for overdose with levetiracetam. If indicated, elimination of unabsorbed drug should be attempted by emesis or gastric layage: usual precautions should be observed to maintain airway. General supportive care of the patient is indicated including monitoring of vital signs and observation of the patient's clinical status. A Certified Poison Control Center should be contacted for up to date information on the management of overdose with levetiracetan 10.3 Hemodialysis

be considered in cases of overdose. Although hemodialysis has not been performed in the few known cases of overdose, it may be indicated by the patient's clinical state or in patients with significant renal impairmen $Leve tiracetam\ injection,\ USP\ is\ an\ antiepileptic\ drug\ available\ as\ a\ clear,\ colorless,\ sterile\ solution\ (100\ mg/mL)\ for$ intravenous administration. The chemical name of levetiracetam, a single enantiomer, is (-)-(S)-α-ethyl-2-oxo-1-pyrrolidine

 $Standard\ hemodialysis\ procedures\ result\ in\ significant\ clearance\ of\ levetiracetam\ (approximately\ 50\%\ in\ 4\ hours)\ and\ should$



Levetiracetam is a white to off-white crystalline powder with a faint odor and a bitter taste. It is very soluble in water (104.0 g/100 mL). It is freely soluble in chloroform (65.3 g/100 mL) and in methanol (53.6 g/100 mL), soluble in ethanol (16.5 g/100 mL), sparingly soluble in acetonitrile (5.7 g/100 mL) and practically insoluble in n-hexane. (Solubility limits are expressed as g/100 mL solvent.) Levetiracetam injection, USP contains 100 mg of levetiracetam per mL. It is supplied in single-dose 5 mL vials containing 500 mg levetiracetam, water for injection, 45 mg sodium chloride, and buffered at approximately pH 5.5 with glacial acetic acid and 8.2 mg sodium acetate trihvdrate. $Levetirac etam\ injection, USP\ must be\ diluted\ prior\ to\ intravenous\ infusion\ \textit{[see Dosage and Administration\ (2.6)]}.$

12.1 Mechanism of Action The precise mechanism(s) by which levetiracetam exerts its antiepileptic effect is unknown. A saturable and stereoselective neuronal binding site in rat brain tissue has been described for levetiracetam. Experimental data

12 CLINICAL PHARMACOLOGY

indicate that this binding site is the synaptic vesicle protein SV2A, thought to be involved in the regulation of vesicle exocytosis. Although the molecular significance of levetiracetam binding to synaptic vesicle protein SV2A is not understood, levetiracetam $and\ related\ analogs\ showed\ a\ rank\ order\ of\ affinity\ for\ SV2A\ which\ correlated\ with\ the\ potency\ of\ their\ antiseizure\ activity\ in$ audiogenic seizure-prone mice. These findings suggest that the interaction of levetiracetam with the SV2A protein may 12.2 Pharmacodynamics Effects on QTc Interval The effect of levetiracetam on QTc prolongation was evaluated in a randomized, double-blind, positive-controlled (moxifloxacin 400 mg) and placebo-controlled crossover study of levetiracetam (1000 mg or 5000 mg) in 52 healthy subjects. The upper

bound of the 90% confidence interval for the largest placebo-adjusted, baseline-corrected QTc was below 10 milliseconds 12.3 Pharmacokinetics Equivalent doses of intravenous (IV) levetiracetam and oral levetiracetam result in equivalent Cmax, Cmin, and total systemic exposure to levetiracetam when the IV levetiracetam is administered as a 15-minute infusion Levetiracetam is rapidly and almost completely absorbed after oral administration. Levetiracetam injection and tablets are

bioequivalent. The pharmacokinetics of levetiracetam are linear and time-invariant, with low intra- and inter-subject variability Levetiracetam is not significantly protein-bound (<10% bound) and its volume of distribution is close to the volume of intracellular and extracellular water. Sixty-six percent (66%) of the dose is renally excreted unchanged. The major metabolic pathway of levetiracetam (24% of dose) is an enzymatic hydrolysis of the acetamide group. It is not liver cytochrome P450 dependent. The metabolites have no known pharmacological activity and are renally excreted. Plasma half-life of levetiracetam across studies is approximately 6 to 8 hours. It is increased in the elderly (primarily due to impaired renal clearance) and in subjects with renal impairment. The pharmacokinetics of levetiracetam are similar when used as monotherapy or as adjunctive therapy for the treatment of

those achieved at T_{max} after an equivalent oral dose. It is demonstrated that levetiracetam 1500 mg intravenous infusion is equivalent to levetiracetam 3×500 mg oral tablets. The time independent pharmacokinetic profile of levetiracetam was trated following 1500 mg intravenous infusion for 4 days with BID dosing. The $AUC_{(01012)}$ at steady-state was equivalent to AUC, following an equivalent single dose. $Leve tiracetam\ and\ its\ major\ metabolite\ are\ less\ than\ 10\%\ bound\ to\ plasma\ proteins;\ clinically\ significant\ interactions\ with$ other drugs through competition for protein binding sites are therefore unlikely Levetiracetam is not extensively metabolized in humans. The major metabolic pathway is the enzymatic hydrolysis of the

acetamide group, which produces the carboxylic acid metabolite, ucb L057 (24% of dose) and is not dependent on any liver

The equivalence of levetiracetam injection and the oral formulation was demonstrated in a bioavailability study of 17 healthy

 $volunteers.\ In\ this\ study,\ levetirace tam\ 1500\ mg\ was\ diluted\ in\ 100\ mL\ 0.9\%\ sterile\ saline\ solution\ and\ was\ infused\ over\ 15$

minutes. The selected infusion rate provided plasma concentrations of levetiracetam at the end of the infusion period similar to

cytochrome P450 isoenzymes. The major metabolite is inactive in animal seizure models. Two minor metabolites were identified as the product of hydroxylation of the 2-oxo-pyrrolidine ring (2% of dose) and opening of the 2-oxo-pyrrolidine ring Levetiracetam plasma half-life in adults is 7±1 hour and is unaffected by either dose, route of administration or repeated administration. Levetiracetam is eliminated from the systemic circulation by renal excretion as unchanged drug which represents 66% of administered dose. The total body clearance is 0.96 mL/min/kg and the renal clearance is 0.6 mL/min/kg. The mechanism of excretion is glomerular filtration with subsequent partial tubular reabsorption. The metabolite ucb L057 is excreted by glomerular filtration and active tubular secretion with a renal clearance of 4 mL/min/kg. Levetiracetam elimination is correlated to creatinine clearance. Levetiracetam clearance is reduced in patients with renal impairment [see Dosage and

Administration (2.6) and Use in Specific Populations (8.6)1. Specific Populations Pharmacokinetics of levetiracetam were evaluated in 16 elderly subjects (age 61to 88 years) with creatinine clearance ranging from 30 to 74 mL/min. Following oral administration of twice-daily dosing for 10 days, total body clearance decreased by 38% and the half-life was 2.5 hours longer in the elderly compared to healthy adults. This is most likely due to the decrease in renal function in these subjects

A population pharmacokinetic analysis for the intravenous formulation was conducted in 49 pediatric patients (1 month to < 16 years of age) weighing 3 to 79 kg. Patients received levetiracetam as a 15-minute IV infusion at doses between 14 mg/kg/day and 60 mg/kg/day twice daily. Plasma concentrations and model derived steady-state exposure AUC (01012) were within the range of the exposure observed in pediatric patients receiving equivalent doses of the oral solution Oral Formulations Pharmacokinetics of levetiracetam were evaluated in 24 pediatric patients (age 6 to 12 years) after single oral dose (20 mg/kg)

pproximately 40% higher than in adults. A repeat dose pharmacokinetic study was conducted in pediatric patients (age 4 to 12 years) at doses of 20 mg/kg/day, 40 mg/kg/day, and 60 mg/kg/day of the immediate release formulation of levetiracetam. The evaluation of the pharmacoking profile of levetiracetam and its metabolite (ucb L057) in 14 pediatric patients demonstrated rapid absorption of levetiracetam a all doses, with a T_{max} of about 1 hour and a $t_{1/2}$ of 5 hours across all dosing levels. The pharmacokinetics of levetiracetam in pediatric patients was linear between 20 to 60 mg/kg/day. The potential interaction of levetiracetam with other AEDs was also evaluated in these patients. Levetiracetam had no significant effect on the plasma concentrations of carbamazepine, valproic acid, topiramate or lamotrigine. However, there was about a 22% increase of apparent clearance of levetiracetam when it was co-administered with an enzyme-inducing AED (e.g., carbamazepine Following single dose administration (20 mg/kg) of a 10% oral solution to pediatric patients with epilepsy (1 month to

of the immediate release formulation of levetiracetam. The body weight adjusted apparent clearance of levetiracetam v

and apparent clearance (1.5 mL/min/kg) was faster than in adults (0.96 mL/min/kg). Population pharmacokinetic analysis showed that body weight was significantly correlated to the clearance of levetiracetam in pediatric patients; clearance increased with an increase in body weight. Levetiracetam levels may decrease during pregnancy [see Warnings and Precautions (5.9) and Use in Specific Populations (8.1)]. Levetiracetam C_{max} and AUC were 20% higher in women (N=11) compared to men (N=12). However, clearances adjusted for

< 4 years), levetiracetam was rapidly absorbed and peak plasma concentrations were observed approximately 1 hour after dosing. Levetiracetam half-life in pediatric patients 1 month to < 4 years with epilepsy was shorter (5.3 h) than in adults (7.2 h),

body weight were comparable Formal pharmacokinetic studies of the effects of race have not been conducted. Cross-study comparisons involving Caucasians (N=12) and Asians (N=12), however, show that pharmacokinetics of levetiracetam were comparable between the two races. Because levetiracetam is primarily renally excreted and there are no important racial differences in creatinine clearance, pharmacokinetic differences due to race are not expected.

The disposition of levetiracetam was studied in adult subjects with varying degrees of renal function. Total body clearance of levetiracetam is reduced in patients with impaired renal function by 40% in the mild group (CLcr = 50 to 80 mL/min), 50% in the moderate group (CLcr = 30 to 50 mL/min) and 60% in the severe renal impairment group (CLcr <30 mL/min). Clearance of levetiracetam is correlated with creatinine clearance. In anuric (end stage renal disease) patients, the total body clearance decreased 70% compared to normal subjects (CLcr >80mL/min). Approximately 50% of the pool of levetiracetam in the body is removed during a standard 4 hour hemodialysis procedure [see Dosage and Administration (2.7)].

In subjects with mild (Child-Pugh A) to moderate (Child-Pugh B) hepatic impairment, the pharmacokinetics of levetiracetam subjects, but decreased renal clearance accounted for most of the decrease. No dose adjustment is needed for patients with In vitro data on metabolic interactions indicate that levetiracetam is unlikely to produce, or be subject to, pharmacokinetic interactions. Levetiracetam and its major metabolite, at concentrations well above Cmax levels achieved within the therapeutic

dose range, are neither inhibitors of, nor high affinity substrates for, human liver cytochrome P450 isoforms, epoxide hydrolase or UDP-glucuronidation enzymes. In addition, levetiracetam does not affect the in vitro glucuronidation of valproic Potential pharmacokinetic interactions of or with levetiracetam were assessed in clinical pharmacokinetic studies (phenytoin valproate, warfarin, digoxin, oral contraceptive, probenecid) and through pharmacokinetic screening in the placebo-controlled

Levetiracetam (3000 mg daily) had no effect on the pharmacokinetic disposition of phenytoin in patients with refractory epilepsy. Pharmacokinetics of levetiracetam were also not affected by phenytoir Levetiracetam (1500 mg twice daily) did not alter the pharmacokinetics of valproate in healthy volunteers. Valproate 500 mg twice daily did not modify the rate or extent of levetiracetam absorption or its plasma clearance or urinary excretion. There also

was no effect on exposure to and the excretion of the primary metabolite, ucb L057. Potential drug interactions between levetiracetam and other AEDs (carbamazepine, gabapentin, lamotrigine, phenobarbital, phenytoin, primidone and valproate) were also assessed by evaluating the serum concentrations of levetiracetam and these AEDs during placebo- controlled clinical studies. These data indicate that levetiracetam does not influence the plasma concentration of other AEDs and that these AEDs do not influence the pharmacokinetics of levetiracetar Fffect of AFDs in Pediatric Patients

There was about a 22% increase of apparent total body clearance of levetiracetam when it was co-administered with enzyme

inducing AEDs. Dose adjustment is not recommended. Levetiracetam had no effect on plasma concentrations of

Oral Contraceptives $Levetiracetam^{'} (500 \ mg \ twice \ daily) \ did \ not \ influence \ the \ pharmacokinetics \ of \ an \ or al \ contraceptive \ containing \ 0.03 \ mg \ ethinyloop \ daily) \ did \ not \ influence \ the \ pharmacokinetics \ of \ an \ or al \ contraceptive \ containing \ 0.03 \ mg \ ethinyloop \ daily) \ did \ not \ influence \ the \ pharmacokinetics \ of \ an \ or al \ contraceptive \ containing \ 0.03 \ mg \ ethinyloop \ daily)$ estradiol and 0.15 mg levonorgestrel, or of the luteinizing hormone and progesterone levels, indicating that impairment of contraceptive efficacy is unlikely. Coadministration of this oral contraceptive did not influence the pharmacokinetics of levetiracetam.

Levetiracetam (1000 mg twice daily) did not influence the pharmacokinetics and pharmacodynamics (ECG) of digoxin given as $a\,0.25\,mg\,dose\,every\,day.\,Coadministration\,of\,digoxin\,did\,not\,influence\,the\,pharmacokinetics\,of\,levetiracetam$ Levetiracetam (1000 mg twice daily) did not influence the pharmacokinetics of R and S warfarin. Prothrombin time was not Probenecid, a renal tubular secretion blocking agent, administered at a dose of 500 mg four times a day, did not change the pharmacokinetics of levetiracetam 1000 mg twice daily. C** _{max} of the metabolite, ucb L057, was approximately doubled in the

presence of probenecid while the fraction of drug excreted unchanged in the urine remained the same. Renal clearance of ucb

 $L057\ in\ the\ presence\ of\ probenecid\ decreased\ 60\%, probably\ related\ to\ competitive\ inhibition\ of\ tubular\ secretion\ of\ ucb\ L057.$ The effect of levetiracetam on probenecid was not studied 13 NONCLINICAL TOXICOLOGY ${\bf 13.1 \ \ Carcinogenesis, Mutagenesis, Impairment of Fertility}$

carbamazepine, valproate, topiramate, or lamotrigine.

Rats were dosed with levetiracetam in the diet for 104 weeks at doses of 50, 300, and 1800 mg/kg/day. Plasma exposure (AUC) at the highest dose was approximately 6 times that in humans at the maximum recommended human dose (MRHD) of 3000 mg. There was no evidence of carcinogenicity. In mice, oral administration of levetiracetam for 80 weeks (doses up to 960 mg/kg/day) or 2 years (doses up to 4000 mg/kg/day, lowered to 3000 mg/kg/day after 45 weeks due to intolerability) was not associated with an increase in tumors. The highest dose tested in mice for 2 years (3000 mg/kg/day) is approximately 5 times the MRHD on a body surface area (mg/m2) basis

 $assays. The \ major \ human \ metabolite \ of \ levetirac etam \ (ucb \ L057) \ was \ negative \ in \ \textit{in vitro} \ (Ames, mouse \ lymphoma) \ assays.$ Impairment of Fertility No adverse effects on male or female fertility or reproductive performance were observed in rats at oral doses up to 1800 mg/kg/day, which were associated with plasma exposures (AUC) up to approximately 6 times that in humans at the 14 CLINICAL STUDIES

Effectiveness in Partial-Onset Seizures in Adults
The effectiveness of levetiracetam for the treatment of partial-onset seizures in adults was established in three multicenter,

randomized, double-blind, placebo-controlled clinical studies in patients who had refractory partial- onset seizures with or

Levetiracetam was negative in in vitro (Ames, chromosomal aberration in mammalian cells) and in vivo (mouse micronucleus)

All clinical studies supporting the efficacy of levetiracetam utilized oral formulations. The finding of efficacy of levetiracetam $injection\ is\ based\ on\ the\ results\ of\ studies\ using\ an\ oral\ formulation\ of\ levetirac etam,\ and\ on\ the\ demonstration\ of\ comparable$ bioavailability of the oral and parenteral formulations [see Clinical Pharmacology (12.3)]. 14.1 Partial-Onset Seizures

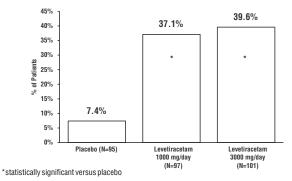
without secondary generalization. The tablet formulation was used in all these studies. In these studies, 904 patients were randomized to placebo, 1000 mg, 2000 mg, or 3000 mg/day. Patients enrolled in Study 2 had refractory partial-onset seizures for at least two years and had taken two or more classical AEDs. Patients enrolled in Study 3 had refractory partial-onset seizures for at least 1 year and had taken one classical AED. At the time of the study, patients were taking a stable dose regimen of at least one and could take a maximum of two AEDs. During the baseline period, patients had to have enced at least two partial-onset seizures during each 4-week period

Study 1 was a double-blind, placebo-controlled, parallel-group study conducted at 41 sites in the United States comparing levetiracetam 1000 mg/day (N=97), levetiracetam 3000 mg/day (N=101), and placebo (N=95) given in equally divided doses twice daily. After a prospective baseline period of 12 weeks, patients were randomized to one of the three treatment groups described above. The 18-week treatment period consisted of a 6-week titration period, followed by a 12-week fixed dose evaluation period, during which concomitant AED regimens were held constant. The primary measure of effectiveness was a een group comparison of the percent reduction in weekly partial seizure frequency relative to placebo over the entire randomized treatment period (titration + evaluation period). Secondary outcome variables included the responder rate

Table 10: Reduction in Mean Over Placebo in Weekly Frequency of Partial-Onset Seizures in Study 1				
	Placebo (N=95)	Levetiracetam 1000 mg/day (N=97)	Levetiracetam 3000 mg/day (N=101)	
Percent reduction in partial seizure frequency over placebo	-	26.1%*	30.1%*	

(incidence of patients with ≥50% reduction from baseline in partial-onset seizure frequency). The results of the analysis of

*statistically significant versus placebo The percentage of patients (y-axis) who achieved ≥50% reduction in weekly seizure rates from baseline in partial-onset seizure frequency over the entire randomized treatment period (titration + evaluation period) within the three treatment groups (x-axis) is presented in Figure 1. Figure 1: Responder Rate (≥50% Reduction from Baseline) in Study 1



 $Study\ 2\ was\ a\ double-blind,\ placebo-controlled,\ crossover\ study\ conducted\ at\ 62\ centers\ in\ Europe\ comparing\ levetiracetam$ 1000 mg/day (N=106), levetiracetam 2000 mg/day (N=105), and placebo (N=111) given in equally divided doses twice daily. The first period of the study (Period A) was designed to be analyzed as a parallel-group study. After a prospective baseline period of up to 12 weeks, patients were randomized to one of the three treatment groups described above. The 16-week treatment period consisted of the 4-week titration period followed by a 12-week fixed dose evaluation period, during which concomitant AED regimens were held constant. The primary measure of effectiveness was a between group comparison of the percent reduction in weekly partial seizure frequency relative to placebo over the entire randomized treatment period (titration \pm evaluation period). Secondary outcome variables included the responder rate (incidence of patients with ≥50% reduction from baseline in partial-onset seizure frequency). The results of the analysis of Period A are displayed in Table 11

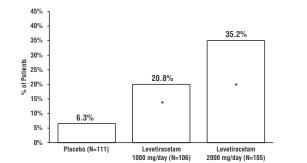
Table 11: Reduction in Mean Over Placebo in Weekly Frequency of Partial-Onset Seizures in Study 2: Period A				
	Placebo (N=111)	Levetiracetam 1000 mg/day (N=106)	Levetiracetam 2000 mg/day (N=105)	
Percent reduction in partial seizure	-	17.1%*	21.4%*	

statistically significant versus placebo

The percentage of patients (y-axis) who achieved ≥50% reduction in weekly seizure rates from baseline in partial-onset seizure

Figure 2: Responder Rate (≥50% Reduction from Baseline) in Study 2: Period A

ency over the entire randomized treatment period (titration + evaluation period) within the three treatment groups (x-axis)

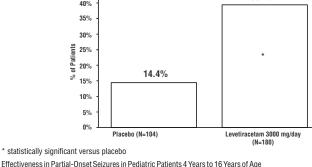


* statistically significant versus placebo The comparison of levetiracetam 2000 mg/day to levetiracetam 1000 mg/day for responder rate was statistically significant (P=0.02). Analysis of the trial as a cross-over yielded similar results

Study 3 was a double-blind, placebo-controlled, parallel-group study conducted at 47 centers in Europe comparing levetiracetam 3000 mg/day (N=180) and placeho (N=104) in patients with refractory partial-onset seizures, with or without dary generalization, receiving only one concomitant AED. Study drug was given in two divided doses. After a prosp baseline period of 12 weeks, patients were randomized to one of two treatment groups described above. The 16-week treatment period consisted of a 4-week titration period, followed by a 12-week fixed dose evaluation period, during which concomitant AFD doses were held constant. The primary measure of effectiveness was a between group comparison of the percent reduction in weekly seizure frequency relative to placebo over the entire randomized treatment period (titration + evaluation period). Secondary outcome variables included the responder rate (incidence of patients with ≥50% reduction from baseline in partial-onset seizure frequency). Table 12 displays the results of the analysis of Study 3.

	Placebo (N=104)	Levetiracetam 3000 mg/day (N=180)
Percent reduction in artial seizure requency over lacebo	-	23%*
atistically significant versus placeb	0	

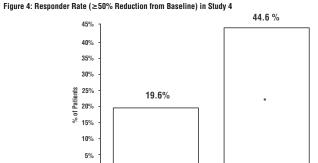
 $frequency\ over\ the\ entire\ randomized\ treatment\ period\ (titration+evaluation\ period)\ within\ the\ two\ treatment\ groups\ (x-axis)$ is presented in Figure 3. Figure 3: Responder Rate (≥50% Reduction from Baseline) in Study 3 39.4% 40% 35%



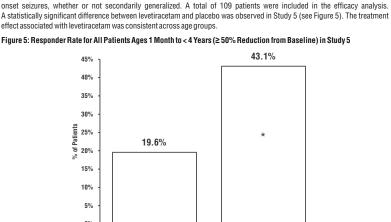
Effectiveness in Partial-Onset Seizures in Pediatric Patients 4 Years to 16 Years of Age Study 4 was a multicenter, randomized double-blind, placebo-controlled study, in pediatric patients 4 to 16 years of age with partial seizures uncontrolled by standard antiepileptic drugs (AEDs). Study 4 was conducted at 60 sites in North America. The study consisted of an 8-week baseline period and 4-week titration period followed by a 10-week evaluation period. Eligible patients who still experienced, on a stable dose of 1 to 2 AEDs, at least 4 partial-onset seizures during the 4 weeks prior to screening, as well as at least 4 partial-onset seizures in each of the two 4-week baseline periods, were randomized to receive either levetiracetam or placebo. Dosing was initiated at a dose of 20 mg/kg/day in two divided doses. During the treatment period, levetiracetam doses were adjusted in 20 mg/kg/day increments, at 2-week intervals to the target dose of 60 mg/kg/day. The primary measure of efficacy was a between group comparison of the percent reduction in weekly partial seizure frequency relative to placebo over the entire 14-week randomized treatment period (titration + evaluation period). Secondary outcome variables included the responder rate (incidence of patients with $\geq 50\%$ reduction from baseline in partial- onset seizure frequency per week). The enrolled population included 198 patients (levetiracetam N=101, placebo N=97) with refractory partial-onset seizures, whether or not secondarily generalized. Table 13 displays the results of Study 4.

	Placebo (N=97)	Levetiracetam (N=101)
Percent reduction in partial seizure frequency over placebo	-	26.8%*

The percentage of patients (y-axis) who achieved \geq 50% reduction in weekly seizure rates from baseline in partial-onset seizure frequency over the entire randomized treatment period (titration + evaluation period) within the two treatment groups (x-axis)



Levetiracetar (N=101) *statistically significant versus placebo Effectiveness in Partial-Onset Seizures in Pediatric Patients 1 Month to <4 Years of Age Study 5 was a multicenter, randomized double-blind, placebo-controlled study, in pediatric patients 1 month to less than 4 years of age with partial seizures, uncontrolled by standard epileptic drugs (AEDs). Study 5 was conducted at 62 sites in North America, South America, and Europe. Study 5 consisted of a 5-day evaluation period, which included a 1-day titration period followed by a 4-day maintenance period. Eligible patients who experienced, on a stable dose of 1 to 2 AEDs, at least 2 partial-onset seizures during the 48-hour baseline video EEG were randomized to receive either levetiracetam or placebo. Randomization was stratified by age range as follows: 1 month to less than 6 months of age (N=4 treated with levetiracetam), 6 months to less than 1 year of age (N=8 treated with levetiracetam), 1 year to less than 2 years of age (N=20 treated with levetiracetam), and 2 years to less than 4 years of age (N=28 treated with levetiracetam). Levetiracetam dosing was determined by age and weight as follows: children 1 month to less than 6 months old were randomized to a target dose of $40 \, \mathrm{mg/kg/day}$, and children 6 months to less than 4 years old were randomized to a target dose of 50 mg/kg/day. The primary measure of efficacy was the responder rate (percent of patients with \geq 50% reduction from baseline in average daily partial-onset seizure frequency) assessed by a blinded central reader using a 48-hour video EEG performed during the last two days of the 4-day maintenance period. The enrolled population included 116 patients (levetiracetam N=60, placebo N=56) with refractory partial-



*statistically significant versus placebo 14.2 Myoclonic Seizures in Patients with Juvenile Myoclonic Epilepsy The effectiveness of levetiracetam as adjunctive therapy in patients 12 years of age and older with juvenile myoclonic epilepsy (JME) experiencing myoclonic seizures was established in one multicenter, randomized, double-blind, placebo-controlle study (study 6), conducted at 37 sites in 14 countries. Eligible patients on a stable dose of 1 antiepileptic drug (AED) experiencing one or more myoclonic seizures per day for at least 8 days during the prospective 8-week baseline period were randomized to either levetiracetam or placebo (levetiracetam N=60, placebo N=60). Patients were titrated over 4 weeks to a target dose of 3000 mg/day and treated at a stable dose of 3000 mg/day over 12 weeks (evaluation period). Study drug was given in 2 divided doses. The primary measure of efficacy was the proportion of patients with at least 50% reduction in the number of days per week with one or more myoclonic seizures during the treatment period (titration + evaluation periods) as

Table 14: Responder Rate (≥50% Reduction from Baseline) in Myoclonic Seizure Days per Week in Study 6

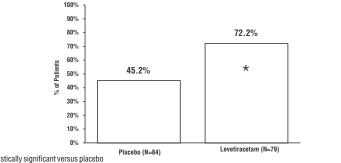
compared to baseline. Table 14 displays the results for the 113 patients with JME in this study.

Percentage of responders	23.7%	60.4%*
* statistically significant vers	us placebo	
14.3 Primary Generalized T	onic-Clonic Seizures	
The effectiveness of levetirac	etam as adjunctive therapy in patients 6 years of a	age and older with idiopathic generalized epilepsy
experiencing primary genera	lized tonic-clonic (PGTC) seizures was establish	ed in one multicenter, randomized, double-blind
placebo-controlled study (stu	udy 7), conducted at 50 sites in 8 countries. Eligit	ole patients on a stable dose of 1 or 2 antiepileptic

drugs (AEDs) experiencing at least 3 PGTC seizures during the 8-week combined baseline period (at least one PGTC seizure during the 4 weeks prior to the prospective baseline period and at least one PGTC seizure during the 4-week prospective baseline period) were randomized to either levetiracetam or placebo. The 8-week combined baseline period is referred to as "baseline" in the remainder of this section. Patients were titrated over 4 weeks to a target dose of 3000 mg/day for adults or a pediatric target dose of 60 mg/kg/day and treated at a stable dose of 3000 mg/day (or 60 mg/kg/day for children) over 20 weeks (evaluation period). Study drug was given in 2 equally divided doses per day. The primary measure of efficacy was the percent reduction from baseline in weekly PGTC seizure frequency for levetiracetam and placebo treatment groups over the treatment period (titration + evaluation periods). The population included 164 patients (levetiracetam N=80, placebo N=84) with idiopathic generalized epilepsy (predominately juvenile myoclonic epilepsy, juvenile absence epilepsy, childhood absence epilepsy, or epilepsy with Grand Mal seizures on awakening) experiencing primary generalized tonic-clonic seizures. Each of these syndromes of idiopathic generalized epilepsy was well represented in this patient population. There was a statistically significant decrease from baseline in PGTC frequency in the levetiracetam -treated patients compared to the placebo-treated patients in Study 7 (see Table 15). Table 15: Median Percent Reduction from Baseline in PGTC Seizure Frequency ner Week in Study 7

	(N=04)	(N=70)			
Percentage reduction in PGTC seizure frequency	44.6%	77.6%*			
*statistically significant versus placebo					
	axis) who achieved ≥50% reduction in weekly mized treatment period (titration + evaluation pe				

Figure 6: Responder Rate (≥50% Reduction from Baseline) in PGTC Seizure Frequency per Week in Study 7



16 HOW SUPPLIED/STORAGE AND HANDLING 16.1 How Supplied Levetiracetam injection, USP 500 mg/5 mL is a clear, colorless, sterile solution. It is supplied in single-dose 5 mL vials (NDC 72485-106-01), available in cartons of 10 vials (NDC 72485-106-10) and 25 vials (NDC 72485-106-25). Store at 25°C (77°F); excursions permitted to 15°to 30°C (59° to 86°F) [see USP Controlled Room Temperature].

<u>Psychiatric Reactions and Changes in Behavior</u> Advise patients and their caregivers that levetiracetam may cause changes in behavior (e.g., aggression, agitation, anger, anxiety, apathy, depression, hostility, and irritability) and psychotic symptoms [see Warnings and Precautions (5.1)]. Effects on Driving or Operating Machinery Inform patients that levetiracetam may cause dizziness and somnolence. Inform patients not to drive or operate machinery until they have gained sufficient experience on levetiracetam to gauge whether it adversely affects their ability to drive or operate machinery [see Warnings and Precautions (5.2)].

Advise patients to discontinue levetiracetam and seek medical care if they develop signs and symptoms of anaphylaxis or

Dermatological Adverse Reactions Advise patients that serious dermatological adverse reactions have occurred in patients treated with levetiracetam and instruct them to call their physician immediately if a rash develops [see Warnings and Precautions (5.4)]. Withdrawal of Levetiracetam Advise patients and caregivers not to discontinue use of levetiracetam without consulting with their healthcare provider. Levetiracetam should normally be gradually withdrawn to reduce the potential of increased seizure frequency and status epilepticus [see Warnings and Precautions (5.7)].

Advise patients to notify their healthcare provider if they become pregnant or intend to become pregnant during levetiracetam therapy. Encourage patients to enroll in the North American Antiepileptic Drug (NAAED) pregnancy registry if they become pregnant [see Use in Specific Populations (8.1)]. Manufactured by Micro Labs Limited Bangalore-560 099, India. Distributed by:

Armas Pharmaceuticals, Inc. Freehold, NJ 07728 (USA) Revised: July 2022

17 PATIENT COUNSELING INFORMATION

angioedema [see Warnings and Precautions (5.3)].

USI-ML14-032/D



Primary Generalized Tonic-Clonic Seizure

Back Side

Front Side