

HIGHLIGHTS OF PRESCRIBING INFORMATION
These highlights do not include all the information needed to use VIGABATRIN TABLETS safely and effectively. See full prescribing information for VIGABATRIN TABLETS.

VIGABATRIN Tablets, for oral use
Initial U.S. Approval: 2009

- WARNING: PERMANENT VISION LOSS**
See full prescribing information for complete boxed warning.
- Vigabatrin can cause permanent bilateral concentric visual field constriction, including tunnel vision that can result in disability. In some cases, vigabatrin may also decrease visual acuity (5.1).
 - Risk increases with increasing dose and cumulative exposure, but there is no dose or exposure to vigabatrin known to be free of risk of vision loss (5.1).
 - Risk of new and worsening vision loss continues as long as vigabatrin is used, and possibly after discontinuation of vigabatrin (5.1).
 - Baseline and periodic vision assessment is recommended for patients on vigabatrin. However, this assessment cannot always prevent vision damage (5.1).
 - Vigabatrin tablets are available only through a restricted program called the VIGABATRIN REMS Program (5.2).

- INDICATIONS AND USAGE**
Vigabatrin tablets are indicated for the treatment of:
- Refractory Complex Partial Seizures as adjunctive therapy in patients greater than or equal to 10 years of age who have responded inadequately to several alternative treatments; Vigabatrin tablets are not indicated as a first line agent (1.1)

- DOSEAGE AND ADMINISTRATION**
Refractory Complex Partial Seizures
- Adults (17 years of age and older): Initiate at 1,000 mg/day (500 mg twice daily); increase total daily dose weekly to 500 mg/day increments; to the recommended dose of 3,000 mg/day (1,500 mg twice daily) (2.2)
 - Pediatric (10 to 16 years of age): Initiate at 500 mg/day (250 mg twice daily); increase total daily dose weekly to 500 mg/day increments; to the recommended maintenance dose of 2,000 mg/day (1,000 mg twice daily); dose patients weighing more than 60 kg according to adult recommendations (2.2)

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FULL PRESCRIBING INFORMATION

- WARNING: PERMANENT VISION LOSS**
- Vigabatrin can cause permanent bilateral concentric visual field constriction, including tunnel vision that can result in disability. In some cases, vigabatrin also can decrease visual acuity and may decrease visual acuity. *[See Warnings and Precautions (5.1)].*
 - The onset of vision loss from vigabatrin is unpredictable, and can occur within weeks of starting treatment or sooner, or at any time after starting treatment, even after months or years.
 - Symptoms of vision loss from vigabatrin are unlikely to be recognized by patients or caregivers before vision loss is severe.
 - Vision loss of milder severity, while often unrecognized by the patient or caregiver, can still adversely affect function.
 - The risk of vision loss increases with increasing dose and cumulative exposure, but there is no dose or exposure known to be free of risk of vision loss.
 - Vision assessment is recommended at baseline (no later than 4 weeks after starting vigabatrin), at least every 3 months during therapy, and about 3 to 6 months after the discontinuation of therapy.
 - Once detected, vision loss due to vigabatrin is not reversible. It is expected that, even with frequent monitoring, some patients will develop severe vision loss.
 - Consider drug discontinuation, balancing benefit and risk, if vision loss is documented.
 - Risk of new or worsening vision loss continues as long as vigabatrin is used. It is possible that vision loss can worsen despite discontinuation of vigabatrin.
 - Because of the risk of vision loss, vigabatrin should be withdrawn from patients with refractory complex partial seizures who fail to show substantial clinical benefit within 3 months of initiation and within 2 to 4 weeks of initiation for patients with infantile spasms, or sooner if treatment failure becomes obvious. Patient response to and continued need for vigabatrin should be periodically reassessed.
 - Vigabatrin should not be used in patients with, or at high risk of, other types of irreversible vision loss unless the benefits of treatment clearly outweigh the risks.
 - Vigabatrin should not be used with other drugs associated with serious adverse ophthalmic effects such as retinopathy or glaucoma unless the benefits clearly outweigh the risks.
 - Use the lowest dosage and shortest exposure to vigabatrin consistent with clinical objectives. *[See Dosage and Administration (2.1)].*

Because of the risk of permanent vision loss, vigabatrin is available only through a restricted program under a Risk Evaluation and Mitigation Strategy (REMS) called the Vigabatrin REMS Program. *[See Warnings and Precautions (5.2)].* Further information is available at www.vigabatrinREMS.com or 1-866-244-8175.

- 1 INDICATIONS AND USAGE**
- 1.1 Refractory Complex Partial Seizures (CPS)**
- Vigabatrin tablets are indicated as adjunctive therapy for adults and pediatric patients 10 years of age and older with refractory complex partial seizures who have inadequately responded to several alternative treatments and for whom the potential benefits outweigh the risk of vision loss. *[See Warnings and Precautions (5.1)].* Vigabatrin tablets are not indicated as a first line agent for complex partial seizures.
- 2 DOSAGE AND ADMINISTRATION**
- 2.1 Important Dosing and Administration Instructions**
- Dosing**
- Use the lowest dosage and shortest exposure to vigabatrin tablets consistent with clinical objectives. *[See Warnings and Precautions (5.1)].*
- The vigabatrin tablet dosing regimen depends on the age group and weight. *[See Dosage and Administration (2.2)].* Patients with impaired renal function require dose adjustment. *[See Dosage and Administration (2.4)].*
- Vigabatrin tablets and powder for oral solution are bioequivalent. Either tablet or powder can be used for CPS.
- Monitoring of vigabatrin plasma concentrations to optimize therapy is not helpful.
- Administration**
- Vigabatrin tablets are given orally with or without food.
- If a decision is made to discontinue vigabatrin tablets, the dose should be gradually reduced. *[See Dosage and Administration (2.2) and Warnings and Precautions (5.6)].*
- 2.2 Refractory Complex Partial Seizures**
- Adults (Patients 17 Years of Age and Older)**
- Treatment should be initiated at 1,000 mg/day (500 mg twice daily). Total daily dose may be increased to 500 mg increments at weekly intervals, depending on response. The recommended dose of vigabatrin tablets in adults is 3,000 mg/day (1,500 mg twice daily). A 6,000 mg/day dose has not been shown to confer additional benefit compared to the 3,000 mg/day dose and is associated with an increased incidence of adverse events.
- In controlled clinical studies in adults with complex partial seizures, vigabatrin was tapered by decreasing the daily dose 1,000 mg/day on a weekly basis until discontinued. *[See Warnings and Precautions (5.6)].*
- Pediatric (Patients 10 to 16 Years of Age)**
- Treatment is based on body weight as shown in Table 1. Treatment should be initiated at a total daily dose of 500 mg/day (250 mg twice daily) and may be increased weekly to 500 mg/day increments to a total maintenance dose of 2,000 mg/day (1,000 mg twice daily). Patients weighing more than 60 kg should be dosed according to adult recommendations.

Body Weight (kg)	Total Daily Starting Dose ¹ (mg/day)		Total Daily Maintenance Dose ¹ (mg/day)	
	mg/day	%	mg/day	%
25 to 60††	500		2,000	

¹Administered in two divided doses.
[†]Maintenance dose is based on 3,000 mg/day adult-equivalent dose
^{††}Patients weighing more than 60 kg should be dosed according to adult recommendations

- Renal Impairment.** Dose adjustment recommended (2.4, 3.5, 3.6).
- DOSEAGE FORMS AND STRENGTHS ---**
- Tablet, 500 mg (3)
- CONTRAINDICATIONS ---**
- None (4)
- WARNINGS AND PRECAUTIONS ---**
- Abnormal MRI signal changes have been reported in some infants with infantile spasms receiving vigabatrin (5.3)
 - Suicidal behavior and ideation: Antiepileptic drugs, including vigabatrin, increase the risk of suicidal thoughts and behavior (5.5)
 - Severe renal impairment (Cl_{CR} greater than 10 to 30 mL/min): dose should be decreased by 25%
 - Withdrawal of AEDs: Taper dose to avoid withdrawal seizures (5.6)
 - Anemia: Monitor for symptoms of anemia (5.7)
 - Somnolence and fatigue: Advise patients not to drive or operate machinery until they have gained sufficient experience on vigabatrin (5.8)

- ADVERSE REACTIONS ---**
- Refractory Complex Partial Seizures
- Most common adverse reactions in controlled studies include (incidence greater than or equal to 5% over placebo):
- Anemia: In addition to permanent vision loss, fatigue, somnolence, nystagmus, tremor, blurred vision, memory impairment, weight gain, arthralgia, abnormal coordination, and confusional state (6.1)
 - Abnormal MRI signal changes (5.3)
 - Neurotoxicity (5.4)
 - Peripheral neuropathy (5.9)
 - Weight gain (5.10)
- Refractory Complex Partial Seizures**
- Most common adverse reactions in controlled studies include (incidence greater than or equal to 5% over placebo):
- Anemia: In addition to permanent vision loss, fatigue, somnolence, nystagmus, tremor, blurred vision, memory impairment, weight gain, arthralgia, abnormal coordination, and confusional state (6.1)
 - Abnormal MRI signal changes (5.3)
 - Neurotoxicity (5.4)
 - Peripheral neuropathy (5.9)
 - Weight gain (5.10)

- 2.4 Patients with Renal Impairment**
- Vigabatrin is primarily eliminated through the kidney.
- Adult and pediatric patients 10 years and older**
- Mild renal impairment (Cl_{CR} greater than 50 to 80 mL/min): dose should be decreased by 25%
 - Moderate renal impairment (Cl_{CR} greater than 30 to 50 mL/min): dose should be decreased by 50%
 - Severe renal impairment (Cl_{CR} greater than 10 to 30 mL/min): dose should be decreased by 75%
- Cl_{CR} in mL/min may be estimated from serum creatinine (mg/dL) using the following formulas:
- Patients 10 to less than 12 years old: Cl_{CR} (mL/min/1.73 m²) = (k × Ht) / Scr
 - Adults (Ht in cm; serum creatinine [Scr] in mg/dL): Cl_{CR} (mL/min/1.73 m²) = (140 - age) × (72.7 × Scr)^{-1.154}
 - Male Child (less than 12 years): K₀₋₇₀
- Adult and pediatric patients 12 years or older:** Cl_{CR} (mL/min) = [140-age (years)] × weight (kg) / [72 × serum creatinine (mg/dL)] × 0.85 for female patients

The effect of dialysis on vigabatrin clearance has not been adequately studied. *[See Clinical Pharmacology (12.3) and Use in Specific Populations (8.6)].*

- DOSEAGE FORMS AND STRENGTHS**
- Vigabatrin tablets USP are available for oral administration and are supplied as follows:
- 500 mg — Each white to off-white, film-coated, oval biconvex tablet functionally-scored on one side and debossed with A314 on the other side contains 500 mg of vigabatrin, USP.
- 4 CONTRAINDICATIONS**
- None.
- 5 WARNINGS AND PRECAUTIONS**
- 5.1 Permanent Vision Loss**
- Vigabatrin can cause permanent vision loss. Because of this risk and because, when it is effective, vigabatrin provides an observable symptomatic benefit; patient response and continued need for treatment should be periodically assessed.
- Based upon adult studies, 30 percent or more of patients can be affected with bilateral concentric visual field constriction ranging in severity from mild to severe. Severe cases may be characterized by tunnel vision to total blindness, which can result in disability. In some cases, vigabatrin also can damage the central retina and may decrease visual acuity. Symptoms of vision loss from vigabatrin are unlikely to be recognized by patients or caregivers before vision loss is severe. Vision loss of milder severity, while often unrecognized by the patient or caregiver, can still adversely affect function.
- Because assessing vision may be difficult in children, the frequency and extent of vision loss is poorly characterized in these patients. For this reason, the understanding of the risk is primarily based on the adult experience. The possibility that vision loss from vigabatrin may be more common, most severe, or have more severe functional consequences in children than in adults cannot be excluded.
- The onset of vision loss from vigabatrin is unpredictable, and can occur within weeks of starting treatment or sooner, or at any time after starting treatment, even after months or years.
- The risk of vision loss increases with increasing dose and cumulative exposure, but there is no dose or exposure known to be free of risk of vision loss.
- In patients with refractory complex partial seizures, vigabatrin should be withdrawn if a substantial clinical benefit is not observed within 3 months of initiating treatment. If, in the clinical judgment of the prescriber, evidence of treatment failure becomes obvious earlier than 3 months, treatment should be discontinued at that time. *[See Dosage and Administration (2.2) and Warnings and Precautions (5.6)].*
- Vigabatrin should not be used in patients with, or at high risk of, other types of irreversible vision loss unless the benefits of treatment clearly outweigh the risks. The interaction of other types of irreversible vision damage with vision damage from vigabatrin has not been well-characterized, but is likely adverse.
- Vigabatrin should not be used with other drugs associated with serious adverse ophthalmic effects such as retinopathy or glaucoma unless the benefits clearly outweigh the risks.
- Monitoring of Vision**
- Monitoring of vision by an ophthalmic professional with expertise in visual field interpretation and the ability to perform dilated indirect ophthalmoscopy of the retina is recommended. *[See Warnings and Precautions (5.2)].* For patients receiving vigabatrin, vision assessment is recommended at baseline (no later than 4 weeks after starting vigabatrin), at least every 3 months while on therapy, and about 3 to 6 months after the discontinuation of therapy. The diagnostic approach should be individualized for the patient and clinical situation.
- In adults and cooperative pediatric patients, perimetry is recommended, preferably by automated threshold visual field testing. Additional testing may also include electrophysiology (e.g., electroretinography [ERG]), optical coherence tomography (OCT), and/or other methods appropriate for the patient. In patients who cannot be tested, treatment may continue according to clinical judgment, with appropriate patient counseling. Because of variability, results from ophthalmic monitoring must be interpreted with caution, and repeat assessment is recommended if results are equivocal. Repeat assessment at the first few weeks of treatment is recommended to establish if, and to what degree, reproducible results can be obtained, and to guide selection of appropriate ongoing monitoring for the patient.
- The onset and progression of vision loss from vigabatrin is unpredictable, and it may occur or worsen precipitously. Once detected, vision loss due to vigabatrin is not reversible. It is expected that even with frequent monitoring, some patients will develop severe vision loss. Consider drug discontinuation, balancing benefit and risk, if vision loss is documented. It is possible that vision loss can worsen despite discontinuation of vigabatrin.

- 5.2 Vigabatrin REMS Program**
- Vigabatrin tablets are available only through a restricted distribution program called the Vigabatrin REMS Program, because of the risk of permanent vision loss.
- Notable requirements of the Vigabatrin REMS Program include the following:
- Prescribers must be certified by enrolling in the program, agreeing to counsel patients on the risk of vision loss and the need for periodic monitoring of vision, and reporting any event suggestive of vision loss to Teva Pharmaceuticals USA, Inc.
 - Patients must enroll in the program.
 - Patients must be certified and must only dispense to patients authorized to receive vigabatrin tablets.
- Further information is available at www.vigabatrinREMS.com or call 1-866-244-8175.
- 5.3 Magnetic Resonance Imaging (MRI) Abnormalities in Infants**
- Abnormal MRI signal changes characterized by increased T2 signal and restricted diffusion in a symmetric pattern involving the thalamus, basal ganglia, brain stem, and cerebellum have been observed in some infants treated with vigabatrin for infantile spasms. In a retrospective epidemiologic study in patients 10 to 20 years of age, the prevalence of these changes was 22% in vigabatrin treated patients and was 4% in patients treated with other therapies.
- In the study above, in post marketing experience, and in published literature reports, these changes generally resolved with discontinuation of treatment. In a few patients, the lesion resolved despite continued use. It has been reported that some infants exhibited coincident motor abnormalities, but no causal relationship has been established and the potential for long-term clinical sequelae has not been adequately studied.
- Neurotoxicity (brain histopathology and neurobehavioral abnormalities) was observed in rats exposed to vigabatrin during late gestation and the neonatal and juvenile periods of development, and brain histopathological changes were observed in dogs exposed to vigabatrin during the juvenile period of development. The relationship between the brain and cerebellum MRI findings in infants treated with vigabatrin for infantile spasms is unknown. *[See Warnings and Precautions (5.4) and Use in Specific Populations (8.1)].*
- For adults treated with vigabatrin, routine MRI surveillance is unnecessary as there is no evidence that vigabatrin causes MRI changes in this population.

- 5.4 Neurotoxicity**
- Vacuoatolysis, characterized by fluid accumulation and separation of the outer layers of myelin, has been observed in brain white matter tracts in adult and juvenile rats and adult mice, dogs, and possibly monkeys following administration of vigabatrin. This lesion, referred to as intramyelinic edema (IME), was seen in animals at doses within the human therapeutic range. A no-effect dose was not established in rats or dogs. In the rat and dog, brain stem and cerebellum MRI abnormalities were observed in animals treated with vigabatrin. In the rat, pathologic changes consisting of swollen or degenerating axons, mineralization, and gliosis were seen in brain areas in which vacuoatolysis had been previously observed. Vacuoatolysis in adult animals was correlated with alterations in MRI and histopathology. Vacuoatolysis was also observed in the brain of rats and dogs. Administration of vigabatrin to rats during the neonatal and juvenile periods of development produced vacuolar changes in the brain gray matter (including the thalamus, midbrain, deep cerebellar nuclei, substantia nigra, hippocampus, and forebrain) which are considered distinct from the IME observed in vigabatrin treated adult animals. Decreased myelination and evidence of oligodendrocyte injury were also observed in the brain of vigabatrin-treated rats. An increase in apoptosis was seen in some brain regions following vigabatrin exposure during the early postnatal period. Long-term neurobehavioral abnormalities (convulsions, neuromotor impairment, learning deficits) were also observed following vigabatrin treatment of young rats. Administration of vigabatrin to juvenile rats during the neonatal and juvenile periods of development had no effect on the development of the brain stem and cerebellum. In some infantile patients treated for IS with vigabatrin, Studies of the effects of vigabatrin on MRI and EP in adult epilepsy patients have demonstrated no clear-cut abnormalities. *[See Warnings and Precautions (5.3)].*
- 5.5 Suicidal Behavior and Ideation**
- Antiepileptic drugs (AEDs), including vigabatrin, increase the risk of suicidal thoughts or behavior (including suicidal thoughts and behavior). Patients taking vigabatrin with any AED for any indication should be monitored for the emergence or worsening of depression, suicidal thoughts or behavior, and/or any unusual changes in mood or behavior.
- Pooled analyses of 199 placebo-controlled clinical trials (mono- and adjunctive-therapy) of 11 different AEDs showed that patients randomized to one of the AEDs had approximately twice the risk (adjusted relative risk, 1.96; 95% CI, 1.2, 2.7) of suicidal thoughts or behavior than patients randomized to placebo. In these trials, which had a median treatment duration of 12 weeks, the estimated incidence rate of suicidal behavior or ideation among 27,863 AED treated patients was 0.43%, compared to 0.24% among 16,029 placebo treated patients, representing an increase of approximately one case of suicidal thoughts or behavior for every 530 patients treated. There were four suicides in drug treated patients in the trials and none in placebo treated patients, but the number is too small to allow any conclusion about drug effect on suicide.
- The increased risk of suicidal thoughts or behavior with AEDs was observed as early as one week after starting drug treatment with AEDs and persisted for the duration of treatment assessed. Because most trials included in the analysis did not extend beyond 24 weeks, the risk of suicidal thoughts or behavior beyond 24 weeks could not be assessed.
- The risk of suicidal thoughts or behavior was generally consistent among drugs in the data analyzed. The finding of increased risk with AEDs of varying mechanisms of action and across a range of indications suggests that the risk applies to all AEDs used for any indication. The risk did not vary substantially by age (5 to 100 years) in the clinical trials analyzed. Table 4 shows absolute and relative risk by indication for all evaluated AEDs.

In patients with refractory complex partial seizures, vigabatrin tablets should be withdrawn if a substantial clinical benefit is not observed within 3 months of initiating treatment. If, in the clinical judgment of the prescriber, evidence of treatment failure becomes obvious earlier than 3 months, treatment should be discontinued at that time. *[See Warnings and Precautions (5.1)].*

In a controlled study in pediatric patients with complex partial seizures, vigabatrin tablets were tapered by decreasing the daily dose by one third every week for three weeks. *[See Warnings and Precautions (5.6)].*

Table 4. Risk by Indication for Antiepileptic Drugs in the Pooled Analysis

Indication	Placebo Patients with Events per 1,000 Patients		Drug Patients with Events per 1,000 Patients		Relative Risk: Incidence of Drug Events in Drug Patients/Incidence in Placebo Patients	Risk Difference: Additional Drug Patients with Events per 1,000 Patients
	No.	%	No.	%		
Epilepsy	1.0	3.4	3.5	2.4	2.3	1.3
Psychiatric	5.7	8.5	1.5	1.5	0.9	0.9
Other	1.0	1.8	1.9	0.9	1.9	0.9
Total	2.4	4.3	1.8	1.9	1.9	0.9

The relative risk for suicidal thoughts or behavior was higher in clinical trials for epilepsy than in clinical trials for psychiatric conditions, but the absolute risk differences were similar for the epilepsy and psychiatric indications.

Anyone considering prescribing vigabatrin or any other AED must balance the risk of suicidal thoughts or behavior with the risk of untreated illness. Epilepsy and many other illnesses for which AEDs are prescribed are themselves associated with morbidity and mortality and an increased risk of suicidal thoughts and behavior. Should suicidal thoughts and behavior emerge during treatment, the prescriber needs to consider whether the emergence of these symptoms in any given patient may be related to the illness being treated.

Patients, their caregivers, and families should be informed that AEDs increase the risk of suicidal thoughts and behavior and should be advised of the need to alert for the emergence or worsening of the signs and symptoms of depression, any unusual changes in mood or behavior, or the emergence of suicidal thoughts, behavior, or thoughts about self-harm. Behaviors of concern should be reported immediately to healthcare providers.

5.6 Withdrawal of Antiepileptic Drugs (AEDs)

As with all AEDs, vigabatrin should be withdrawn gradually. However, if withdrawal is needed because of a serious adverse event, rapid discontinuation can be considered. Patients and caregivers should be told not to suddenly discontinue vigabatrin therapy.

In controlled clinical studies in adults with complex partial seizures, vigabatrin was tapered by decreasing the daily dose 1,000 mg/day on a weekly basis until discontinued.

In a controlled study in pediatric patients with complex partial seizures, vigabatrin was tapered by decreasing the daily dose by one third every week for three weeks.

5.7 Anemia

In North American controlled trials in adults, 6% of patients (16/280) receiving vigabatrin and 2% of patients (3/188) receiving placebo had adverse events of anemia and/or met criteria for potentially clinically important hematology changes involving hemoglobin, hematocrit, and/or RBC indices. Across U.S. controlled trials, there were mean decreases in hemoglobin of about 3% and 0% in vigabatrin and placebo treated patients, respectively, and a mean decrease in hematocrit of about 1% in vigabatrin treated patients compared to a mean gain of about 1% in patients treated with placebo.

In controlled and open label epilepsy trials in adults and pediatric patients, 3 vigabatrin patients (0.06%, 3/4855) discontinued for anemia and 2 vigabatrin patients experienced unexplained declines in hemoglobin to below 8 g/dL and/or hematocrit below 24%.

5.8 Somnolence and Fatigue

Vigabatrin causes somnolence and fatigue. Patients should be advised not to drive a car or operate other complex machinery until they are familiar with the effects of vigabatrin on their ability to perform such activities.

Pooled data from two vigabatrin controlled trials in adults demonstrated that 24% (54/222) of vigabatrin patients experienced somnolence compared to 10% (14/135) of placebo patients. In those same studies, 28% of vigabatrin patients experienced fatigue compared to 15% (20/135) of placebo patients. Almost 1% of vigabatrin patients discontinued from clinical trials for somnolence and almost 1% discontinued for fatigue.

Pooled data from three vigabatrin controlled trials in pediatric patients demonstrated that 6% (10/165) of vigabatrin patients experienced somnolence compared to 5% (5/104) of placebo patients. In those same studies, 10% (17/165) of vigabatrin patients experienced fatigue compared to 7% (7/104) of placebo patients. No vigabatrin patients discontinued from clinical trials due to somnolence or fatigue.

5.9 Peripheral Neuropathy

Vigabatrin causes symptoms of peripheral neuropathy in adults. Pediatric clinical trials were not designed to assess symptoms of peripheral neuropathy, but observed incidence of symptoms based on pooled data from safety studies of vigabatrin patients appeared similar for pediatric patients on vigabatrin and placebo. In a pool of North American controlled and uncontrolled epilepsy studies, 4.2% (19/457) of vigabatrin patients developed signs and/or symptoms of peripheral neuropathy. In the subset of North American placebo-controlled epilepsy trials, 1.4% (4/280) of vigabatrin treated patients and no (0/188) placebo patients developed signs and/or symptoms of peripheral neuropathy. Initial manifestations of peripheral neuropathy in these trials included, in some combination, symptoms of numbness or tingling in the toes or feet, signs of reduced distal lower limb vibration or position sensation, or progressive loss of reflexes, starting at the ankles. Clinical studies in the development program were not designed to investigate peripheral neuropathy systematically and did not include nerve conduction studies, quantitative sensory testing, or skin or nerve biopsy. There is insufficient evidence to determine if development of these signs and symptoms was related to duration of vigabatrin treatment, cumulative dose, or if the findings of peripheral neuropathy were completely reversible upon discontinuation of vigabatrin.

5.10 Weight Gain

Vigabatrin causes weight gain in adult and pediatric patients.

Data pooled from randomized controlled trials in pediatric patients with refractory complex partial seizures found that 47% (17/363) of vigabatrin patients versus 19% (19/102) of placebo patients gained greater than or equal to 7% of baseline body weight. In these same trials, the mean weight change among vigabatrin patients was 3.5 kg compared to 1.6 kg for placebo patients.

Data pooled from randomized controlled trials in pediatric patients with refractory complex partial seizures found that 47% (17/363) of vigabatrin patients versus 19% (19/102) of placebo patients gained greater than or equal to 7% of baseline body weight.

In all epilepsy trials, 0.6% (31/4855) of vigabatrin patients discontinued for weight gain. The long term effects of vigabatrin related weight gain are not known. Weight gain was not related to the occurrence of edema.

5.11 Edema

Vigabatrin causes edema in adults. Pediatric clinical trials were not designed to assess edema, but observed incidence of edema based on pooled data from controlled pediatric studies appeared similar for pediatric patients on vigabatrin and placebo.

Pooled data from controlled trials demonstrated increased risk among vigabatrin patients compared to placebo patients for peripheral edema (vigabatrin 2%, placebo 1%) and edema (vigabatrin 1%, placebo 0%). In these studies, one vigabatrin and no placebo patients discontinued for an edema related AE. In adults, there was no apparent association between edema and cardiovascular adverse events such as hypertension or congestive heart failure. Edema was not associated with laboratory changes suggestive of deterioration in renal or hepatic function.

The following serious and otherwise important adverse reactions are described elsewhere in labeling:

- Permanent Vision Loss *[See BOXED WARNING and Warnings and Precautions (5.1)]*
- Magnetic Resonance Imaging (MRI) Abnormalities in Infants *[See Warnings and Precautions (5.3)]*
- Neurotoxicity *[See Warnings and Precautions (5.4)]*
- Suicidal Behavior and Ideation *[See Warnings and Precautions (5.5)]*
- Withdrawal of Antiepileptic Drugs (AEDs) *[See Warnings and Precautions (5.6)]*
- Anemia *[See Warnings and Precautions (5.7)]*
- Somnolence and Fatigue *[See Warnings and Precautions (5.8)]*
- Peripheral Neuropathy *[See Warnings and Precautions (5.9)]*
- Weight Gain *[See Warnings and Precautions (5.10)]*
- Edema *[See Warnings and Precautions (5.11)]*

6.1 Clinical Trial 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.

In U.S. and primary non-U.S. clinical studies of 4,079 vigabatrin treated patients, the most common (greater than or equal to 5%) adverse reactions associated with the use of vigabatrin in combination with other AEDs were headache, somnolence, fatigue, dizziness, convulsion, nasopharyngitis, weight changes, blurred vision, dizziness, visual field defect, depression, tremor, nystagmus, nausea, diarrhea, memory impairment, insomnia, irritability, abnormal coordination, blurred vision, diplopia, vomiting, influenza, pyrexia, and rash.

The adverse reactions most commonly associated with vigabatrin treatment discontinuation in greater than or equal to 1% of patients were convulsion and depression.

Refractory Complex Partial Seizures

Table 5 lists the adverse reactions that occurred in greater than or equal to 2% and more than one patient per vigabatrin treated group and that occurred more frequently than in placebo patients from 2 U.S. add-on clinical studies of refractory CPS in adults.

Table 5. Adverse Reactions in Pooled, Add-On Trials in Adults with Refractory Complex Partial Seizures

Body System Adverse Reaction	Vigabatrin Dosage (mg/day)		
	3000 (N=134) %	6000 (N=43) %	Placebo (N=135) %
Eye Disorders			
Blurred vision	13	16	5
Diplopia	7	16	3
Asthenopia	2	2	0
Eye pain	0	5	0
Gastrointestinal Disorders			
Diarrhea	10	16	7
Nausea	10	2	8
Vomiting	7	9	6
Constipation	8	5	3
Upper abdominal pain	5	5	3
Dyspepsia	4	5	3
Stomach discomfort	3	2	1
Abdominal pain	3	2	1
Toothache	2	5	2
Abdominal distention	2	0	1
General Disorders			
Fatigue	23	40	16
Gait disturbance	6	12	7
Asthenia	5	7	1
Edema peripheral	5	7	1
Fever	4	7	3
Chest pain	1	5	1
Thirst	2	0	0
Malaise	0	5	0
Infections			
Nasopharyngitis	14	9	10
Upper respiratory tract infection	7	9	6
Influenza	5	7	4
Urinary tract infection	4	5	0
Bronchitis	0	5	1

Table 5. Adverse Reactions in Pooled, Add-On Trials in Adults with Refractory Complex Partial Seizures

Body System Adverse Reaction	Vigabatrin Dosage (mg/day)		
	3000 (N=134) %	6000 (N=43) %	Placebo (N=135) %
Injury			
Contusion	3	5	2
Joint sprain	1	2	1
Muscle strain	1	2	1
Wound secretion	0	2	0
Metabolism and Nutrition Disorders			
Increased appetite	1	5	1
Weight gain	6	14	3
Musculoskeletal Disorders			
Arthralgia	10	5	3
Back pain	4	7	2
Pain in extremity	6	2	4
Myalgia	3	5	1
Muscle twitching	1	9	1
Muscle spasms	3	0	1
Nervous System Disorders			

How should I take vigabatrin?

- Vigabatrin comes as tablets.

- You or your child will receive vigabatrin from a specialty pharmacy.
- Take vigabatrin exactly as your healthcare provider tells you to. Vigabatrin is usually taken 2 times each day.
- Vigabatrin may be taken with or without food.
- Before starting to take vigabatrin, talk to your healthcare provider about what you or your child should do if a vigabatrin dose is missed.
- If you or your child are taking vigabatrin for CPS and the seizures do not improve enough within 3 months, your healthcare provider will stop prescribing vigabatrin.

- Do not stop taking vigabatrin suddenly.** This can cause serious problems. Stopping vigabatrin or any seizure medicine suddenly can cause seizures that will not stop (status epilepticus) in people who are being treated for seizures. You should follow your healthcare provider's instructions on how to stop taking vigabatrin.

- Tell your healthcare provider right away about any increase in seizures when vigabatrin treatment is being stopped.** Before your child starts taking vigabatrin, speak to your child's healthcare provider about what to do if your child misses a dose, vomits, spits up, or only takes part of the dose of vigabatrin.

- Do not stop taking vigabatrin without talking to your healthcare provider.** If vigabatrin improves your (or your child's) seizures, you and your healthcare provider should talk about whether the benefit of taking vigabatrin is more important than the risk of vision loss, and decide if you (or your child) will continue to take vigabatrin.

What should I avoid while taking vigabatrin?

Vigabatrin causes sleepiness and tiredness. Adults taking vigabatrin should not drive, operate machinery, or perform any hazardous task, unless you and your healthcare provider have decided that you can do these things safely.

What are the possible side effects of vigabatrin?

Vigabatrin can cause serious side effects, including:

- See “What is the most important information I should know about vigabatrin?”**
- sleepiness and tiredness.** See “What should I avoid while taking vigabatrin?”

- weight gain that happens without swelling**

The following serious side effects happen in **adults**. It is not known if these side effects also happen in babies who take vigabatrin.

- low red blood cell counts (anemia)**

- nerve problems.** Symptoms of a nerve problem can include numbness and tingling in your toes or feet. It is not known if nerve problems will go away after you stop taking vigabatrin.

- swelling**

If you or your child has CPS, vigabatrin may make certain types of seizures worse. Tell your healthcare provider right away if your (or your child's) seizures get worse.

The most common side effects of vigabatrin in **adults** include:

- problems walking or feeling uncoordinated
- feeling dizzy
- shaking (tremor)
- joint pain
- memory problems and not thinking clearly
- eye problems: blurry vision, double vision and eye movements that you cannot control

The most common side effects of vigabatrin in **children 10 to 16 years of age** include:

- weight gain
- tiredness
- upper respiratory tract infection
- aggression

- Also expect side effects like those seen in adults

Tell your healthcare provider if you or your child have any side effect that bothers you or that does not go away. These are not all the possible side effects of vigabatrin.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

How should I store vigabatrin?

- Store vigabatrin tablets at room temperature, between 68°F to 77°F (20°C to 25°C).

- Keep vigabatrin tablets in the container they come in.

Keep vigabatrin and all medicines out of the reach of children.

General information about the safe and effective use of vigabatrin.

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. You can ask your pharmacist or healthcare provider for information about vigabatrin that is written for health professionals. Do not use vigabatrin for a condition for which it was not prescribed. Do not give vigabatrin to other people, even if they have the same symptoms that you have. It may harm them.

What are the ingredients in vigabatrin tablets?

Active Ingredient: vigabatrin, USP

Inactive Ingredients: hypromellose 2910, magnesium stearate, microcrystalline cellulose, polyethylene glycol 400, polyethylene glycol 8000, polysorbate 80, povidone, sodium starch glycolate and titanium dioxide.

Manufactured in India by: **Watson Pharma Private Limited**, Verna, Salcette Goa 403 722 INDIA
Manufactured for: **Teva Pharmaceuticals USA, Inc.**, North Wales, PA 19454
For more information call Teva Pharmaceuticals USA, Inc. at 1-888-838-2872.

Administration of vigabatrin (oral doses of 50 to 200 mg/kg) to pregnant rabbits throughout the period of organogenesis was associated with an increased incidence of malformations (cleft palate) and embryo-fetal death; these findings were observed in two separate studies. The no-effect dose for teratogenicity and embryofetality in rabbits (100 mg/kg) is approximately 1/2 the maximum recommended human dose (MRHD) of 3 g/day on a body surface area (mg/m²) basis. In rats, oral administration of vigabatrin (50, 100, or 150 mg/kg) throughout organogenesis resulted in decreased fetal body weights and increased incidences of fetal anatomic variations. The no-effect dose for embryo-fetal toxicity in rats (50 mg/kg) is approximately 1/5 the MRHD on a mg/m² basis. Oral administration of vigabatrin (50, 100, 150 mg/kg) to rats from the latter part of pregnancy through weaning produced long-term neurohistopathological (hippocampal vacuolation) and neurobehavioral (convulsions) abnormalities in the offspring. A no-effect dose for developmental neurotoxicity in rats was not established; the low-effect dose (50 mg/kg) is approximately 1/5 the MRHD on a mg/m² basis.

In a published study, vigabatrin (300 or 450 mg/kg) was administered by intraperitoneal injection to a mutant mouse strain on a single day during organogenesis (day 7, 8, 9, 10, 11, or 12). In mice exposed in malformations (including cleft palate) was observed at both doses.

Oral administration of vigabatrin (5, 15, or 50 mg/kg) to young rats during the neonatal and juvenile periods of development (postnatal days 4 to 65) produced neurobehavioral (convulsions, neuromotor impairment, learning deficits) and neurohistopathological (brain vacuolation, decreased myelination, and retinal dysplasia) abnormalities in treated animals. The early postnatal period in rats is generally thought to correspond to late pregnancy in humans in terms of brain development.

The no-effect dose for developmental neurotoxicity in juvenile rats (5 mg/kg) was associated with plasma vigabatrin exposures (AUC) less than 1/30 of those measured in pediatric patients receiving an oral dose of 50 mg/kg.

Pregnancy Registry

To provide information regarding the effects of *in utero* exposure to vigabatrin, physicians are advised to recommend that pregnant patients taking vigabatrin enroll in the North American Antiepileptic Drug (NAAED) Pregnancy Registry. This can be done by calling the toll free number 1-888-233-2334, and must be done by patients themselves. Information on the registry can also be found at the website http://www.aedpregnancyregistry.org/.

8.3 Nursing Mothers

Vigabatrin is excreted in human milk. Because of the potential for serious adverse reactions from vigabatrin in nursing infants, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother [see *Warnings and Precautions* (5.3, 5.4)].

8.4 Pediatric Use

The safety and effectiveness of vigabatrin as adjunctive treatment of refractory complex partial seizures in pediatric patients aged 10 to 16 years of age have been established [see *Clinical Studies* (14.1)]. The dosing recommendation in this population varies according to age group and is weight based [see *Dosage and Administration* (2.2)]. Adverse reactions in this pediatric population are similar to those observed in the adult population [see *Adverse Reactions* (6.1)].

The safety and effectiveness of vigabatrin have not been established in pediatric patients under 10 years of age with refractory complex partial seizures.

Abnormal MRI signal changes were observed in infants [see *Warnings and Precautions* (5.3, 5.4)].

Oral administration of vigabatrin (5, 15, or 50 mg/kg) to young rats during the neonatal and juvenile periods of development (postnatal days 4 to 65) produced neurobehavioral (convulsions, neuromotor impairment, learning deficits) and neurohistopathological (brain gray matter vacuolation, decreased myelination, and retinal dysplasia) abnormalities. The no-effect dose for developmental neurotoxicity in juvenile rats (the lowest dose tested) was associated with plasma vigabatrin exposures (AUC) substantially less than those measured in pediatric patients at recommended doses. In dogs, oral administration of vigabatrin (30 or 100 mg/kg) during selected periods of juvenile development (postnatal days 22 to 112) produced neurohistopathological abnormalities (brain gray matter vacuolation). Neurobehavioral effects of vigabatrin were not assessed in the juvenile dog. A no-effect dose for neurohistopathology was not established in juvenile dogs; the lowest effect dose (30 mg/kg) was associated with plasma vigabatrin exposures lower than those measured in pediatric patients at recommended doses [see *Warnings and Precautions* (5.4)].

8.5 Geriatric Use

Clinical studies of vigabatrin did not include sufficient numbers of patients aged 65 and over to determine whether they responded differently from younger patients.

Vigabatrin is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function.

Oral administration of a single dose of 1.5 g of vigabatrin to elderly (greater than or equal to 65 years) patients with reduced creatinine clearance (less than 50 mL/min) was associated with moderate to severe sedation and confusion in 4 of 5 patients, lasting up to 5 days. The renal clearance of vigabatrin was 36% lower in healthy elderly subjects (greater than or equal to 65 years) than in young healthy males. Adjustment of dose or frequency of administration should be considered. Such patients may respond to a lower maintenance dose [see *Dosage and Administration* (2.4) and *Clinical Pharmacology* (12.3)].

Other reported clinical experience has not identified differences in responses between the elderly and younger patients.

8.6 Renal Impairment

Dose adjustment, including initiating treatment with a lower dose, is necessary in pediatric patients 10 years of age and older and adults with mild (creatinine clearance greater than 50 to 80 mL/min), moderate (creatinine clearance greater than 30 to 50 mL/min) and severe (creatinine clearance greater than 10 to 30 mL/min) renal impairment [see *Dosage and Administration* (2.4) and *Clinical Pharmacology* (12.3)].

9

9 DRUG ABUSE AND DEPENDENCE

9.1 Controlled Substance

Vigabatrin is not a controlled substance.

9.2 Abuse

Vigabatrin did not produce adverse events or overt behaviors associated with abuse when administered to humans or animals. It is not possible to predict the extent to which a CNS active drug will be misused, diverted, and/or abused once marketed. Consequently, physicians should carefully evaluate patients for history of drug abuse and follow such patients closely, observing them for signs of misuse or abuse of vigabatrin (e.g., incrementation of dose, drug-seeking behavior).

9.3 Dependence

Following chronic administration of vigabatrin to animals, there was no apparent withdrawal signs upon drug discontinuation. However, as with all AEDs, vigabatrin should be withdrawn gradually to minimize increased seizure frequency [see *Warnings and Precautions* (5.6)].

10 OVERDOSAGE

10.1 Signs, Symptoms, and Laboratory Findings of Overdosage

Confirmed and/or suspected vigabatrin overdoses have been reported during clinical trials and in post marketing surveillance. No vigabatrin overdoses resulted in death. When reported, the vigabatrin dose ingested ranged from 3 g to 90 g, but most were between 7.5 g and 30 g. Nearly half the cases involved multiple drug ingestions including carbamazepine, barbiturates, benzodiazepines, lamotrigine, valproic acid, acetaminophen, and/or chlorpheniramine. Coma, unconsciousness, and/or drowsiness were described in the majority of cases of vigabatrin overdose. Other less commonly reported symptoms included vertigo, psychosis, apnea or respiratory depression, bradycardia, agitation, irritability, confusion, headache, hypotension, abnormal behavior, increased seizure activity, status epilepticus, and speech disorder. These symptoms resolved with supportive care.

10.2 Management of Overdosage

There is no specific antidote for vigabatrin overdose. Standard measures to remove unabsorbed drug should be used, including elimination by emesis or gastric lavage. Supportive measures should be employed, including monitoring of vital signs and observation of the clinical status of the patient.

In an *in vitro* study, activated charcoal did not significantly adsorb vigabatrin.

The effectiveness of hemodialysis in the treatment of vigabatrin overdose is unknown. In isolated case reports in renal failure patients receiving therapeutic doses of vigabatrin, hemodialysis reduced vigabatrin plasma concentrations by 40% to 60%.

11 DESCRIPTION

Vigabatrin tablets, USP are an oral antiepileptic drug and are available as white film-coated 500 mg tablets. The chemical name of vigabatrin USP, a racemate consisting of two enantiomers, is (±) 4-amino-5-hexenoic acid. The molecular formula is C₆H₁₁NO₂ and the molecular weight is 129.16. It has the following structural formula.



Vigabatrin, USP is a white to off-white powder which is freely soluble in water, slightly soluble in methyl alcohol, very slightly soluble in ethyl alcohol and chloroform, and insoluble in toluene and hexane. The pH of a 1% aqueous solution is about 6.9. The n-octanol/water partition coefficient of vigabatrin, USP is about 0.011 (log P=−1.96) at physiologic pH. Vigabatrin, USP melts with decomposition in a 3-degree range within the temperature interval of 171°C to 176°C. The dissociation constants (pK_a) of vigabatrin, USP are 4 and 9.7 at room temperature (25°C).

Each vigabatrin tablet contains 500 mg of vigabatrin, USP. The inactive ingredients are hypromellose 2910, magnesium stearate, microcrystalline cellulose, polyethylene glycol 400, polyethylene glycol 8000, polysorbate 80, povidone, sodium starch glycolate, and titanium dioxide.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

The precise mechanism of vigabatrin's anti-seizure effect is unknown, but it is believed to be the result of its action as an irreversible inhibitor of γ-aminobutyric acid transaminase (GABA-T), the enzyme responsible for the metabolism of the inhibitory neurotransmitter GABA. This action results in increased levels of GABA in the central nervous system.

No direct correlation between plasma concentration and efficacy has been established. The duration of drug effect is presumed to be dependent on the rate of enzyme re-synthesis rather than on the rate of elimination of the drug from the systemic circulation.

12.2 Pharmacodynamics

Effects on Electrocardiogram

There is no indication of a QTc prolonging effect of vigabatrin in single doses up to 6.0 g. In a randomized, placebo-controlled, crossover study, 58 healthy subjects were administered a single oral dose of vigabatrin (3 g and 6 g) and placebo. Peak concentrations for 6.0 g vigabatrin were approximately 2-fold higher than the peak concentrations following the 3.0 g single oral dose.

12.3 Pharmacokinetics

Vigabatrin displayed linear pharmacokinetics after administration of single doses ranging from 0.5 g to 4 g, and after administration of repeated doses of 0.5 g and 2.0 g twice daily. Bioequivalence has been established between the oral solution and tablet formulations. The following PK information (T_{max}, half-life, and clearance) of vigabatrin was obtained from stand-alone PK studies and population PK analyses.

Absorption

Following oral administration, vigabatrin is essentially completely absorbed. The time to maximum concentration (T_{max}) is approximately 1 hour for children (10 years to 16 years) and adults. There was little accumulation with multiple dosing in adult and pediatric patients. A food effect study involving administration of vigabatrin to healthy volunteers under fasting and fed conditions indicated that the C_{max} was decreased by 33%, T_{max} was increased to 2 hours, and AUC was unchanged under fed conditions.

Distribution

Vigabatrin does not bind to plasma proteins. Vigabatrin is widely distributed throughout the body; mean steady-state volume of distribution is 1.1 L/kg (CV = 20%).

Metabolism and Elimination

Vigabatrin is not significantly metabolized; it is eliminated primarily through renal excretion. The terminal half-life of vigabatrin is about 9.5 hours for children (10 years to 16 years), and 10.5 hours for adults. Following administration of [¹⁴C]-vigabatrin to healthy male volunteers, about 95% of total radioactivity was recovered in the urine over 72 hours with the parent drug representing about 80% of this. Vigabatrin induces CYP2C9, but does not induce other hepatic cytochrome P450 enzyme systems.

Specific Populations

Geriatric

The renal clearance of vigabatrin in healthy elderly patients (greater than or equal to 65 years of age) was 36% less than those in healthy young patients. This finding is confirmed by an analysis of data from a controlled clinical trial [see *Use in Specific Populations* (8.5)].

Pediatric

The clearance of vigabatrin is 5.8 L/hr for children (10 years to 16 years) and 7 L/hr for adults.

Gender

No gender differences were observed for the pharmacokinetic parameters of vigabatrin in patients.

Race

No specific study was conducted to investigate the effects of race on vigabatrin pharmacokinetics. A cross study comparison between 23 Caucasian and 7 Japanese patients who received 1, 2, and 4 g of vigabatrin indicated that the AUC, C_{max}, and half-life were similar for the two populations. However, the mean renal clearance of Caucasians (5.2 L/hr) was about 25% higher than the Japanese (4.0 L/hr). Inter-subject variability in renal clearance was 20% in Caucasians and was 30% in Japanese.

Renal Impairment

Mean AUC increased by 30% and the terminal half-life increased by 55% (8.1 hr vs 12.5 hr) in adult patients with mild renal impairment (Cl_{cr} from greater than 50 to 80 mL/min) in comparison to normal subjects.

Mean AUC increased by two-fold and the terminal half-life increased by two-fold in adult patients with moderate renal impairment (Cl_{cr} from greater than 30 to 50 mL/min) in comparison to normal subjects.

Mean AUC increased by 4.5-fold and the terminal half-life increased by 3.5-fold in adult patients with severe renal impairment (Cl_{cr} from greater than 10 to 30 mL/min) in comparison to normal subjects.

Adult patients with renal impairment

Dosage adjustment, including starting at a lower dose, is recommended for adult patients with any degree of renal impairment [see *Use in Specific Populations* (8.6) and *Dosage and Administration* (2.4)].

Pediatric patients 10 years and older with renal impairment

Although information is unavailable on the effects of renal impairment on vigabatrin clearance in pediatric patients 10 years and older, dosing can be calculated based upon adult data and an established formula [see *Use in Specific Populations* (8.6) and *Dosage and Administration* (2.4)].

Hepatic Impairment

Vigabatrin is not significantly metabolized. The pharmacokinetics of vigabatrin in patients with impaired liver function has not been studied.

Drug Interactions

Phenytoin

A 16% to 20% average reduction in total phenytoin plasma levels was reported in adult controlled clinical studies. *In vitro* drug metabolism studies indicate that decreased phenytoin concentrations upon addition of vigabatrin therapy are likely to be the result of induction of cytochrome P450 2C enzymes in some patients. Although phenytoin dose adjustments are not routinely required, dose adjustment of phenytoin should be considered if clinically indicated [see *Drug Interactions* (7.1)].

Clozapepam

In a study of 12 healthy adult volunteers, clozapepam (0.5 mg) co-administration had no effect on vigabatrin (1.5 g twice daily) concentrations. Vigabatrin increases the mean C_{max} of clozapepam by 30% and decreases the mean T_{max} by 45% [see *Drug Interactions* (7.1)].

Other AEDs

When co-administered with vigabatrin, phenobarbital concentration (from phenobarbital or primidone) was reduced by an average of 8% to 16%, and sodium valproate plasma concentrations were reduced by an average of 8%. These reductions did not appear to be clinically relevant. Based on significant differences in pharmacokinetic parameters (elimination half-life, AUC, C_{max}, apparent oral clearance, time to peak, and apparent volume of distribution) of vigabatrin were found after treatment with ethylal estrodiol and levonorgestrel [see *Drug Interactions* (7.1)].

Alcohol

Co-administration of ethanol (0.6 g/kg) with vigabatrin (1.5 g twice daily) indicated that neither drug influences the pharmacokinetics of the other.

Oral Contraceptives

In a double-blind, placebo-controlled study using a combination oral contraceptive containing 30 mcg ethinyl estradiol and 150 mcg levonorgestrel, vigabatrin (3 g/day) did not interfere significantly with the cytochrome P450 3A4-mediated metabolism of the contraceptive tested. Based on this study, vigabatrin is unlikely to affect the efficacy of steroid oral contraceptives. Additionally, no significant difference in pharmacokinetic parameters (elimination half-life, AUC, C_{max}, apparent oral clearance, time to peak, and apparent volume of distribution) of vigabatrin were found after treatment with ethinyl estradiol and levonorgestrel [see *Drug Interactions* (7.2)].

13

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Vigabatrin showed no carcinogenic potential in mouse or rat when given in the diet at doses up to 150 mg/kg/day for 18 months (mouse) or at doses up to 150 mg/kg/day for 2 years (rat). These doses are less than the maximum recommended human dose (MRHD) for refractory complex partial seizures (3 g/day) on a mg/m² basis.

Vigabatrin was negative in *in vitro* Ames, CHO/HGPRT mammalian cell forward gene mutation, chromosomal aberration (in rat lymphocytes) and *in vivo* mouse bone marrow micronucleus assays.

No adverse effects on male or female fertility were observed in rats at oral doses up to 150 mg/kg/day (approximately 1/2 the MRHD of 3 g/day on a mg/m² basis) for adults treated with refractory complex partial seizures.

14 CLINICAL STUDIES

14.1 Complex Partial Seizures

Adults

The effectiveness of vigabatrin as adjunctive therapy in adult patients was established in two U.S. multicenter, double-blind, placebo-controlled, parallel-group clinical studies. A total of 357 adults (age 18 to 60 years) with complex partial seizures, with or without secondary generalization, were enrolled (Studies 1 and 2). Patients were required to be on an adequate and stable dose of an anticonvulsant, and have a history of failure on an adequate regimen of carbamazepine or phenytoin. Patients had a history of about 8 seizures per month (median) for about 20 years (median) prior to entrance into the study. These studies were not capable by design of demonstrating direct superiority of vigabatrin over any other anticonvulsant. Patients who were randomized to the patient had not adequately responded. Further, in these studies, patients had previously been treated with a limited range of anticonvulsants.

The primary measure of efficacy was the patient's reduction in mean monthly frequency of complex partial seizures plus partial seizures secondarily generalized at end of study compared to baseline.

Study 1

Study 1 (N=174) was a randomized, double-blind, placebo-controlled, dose-response study consisting of an 8-week baseline period followed by an 18-week treatment period. Patients were randomized to receive placebo or 1, 3, or 6 g/day vigabatrin administered twice daily. During the first 6 weeks following randomization, the dose was titrated upward beginning with 1 g/day and increasing by 0.5 g/day on days 1 and 5 of each subsequent week in the 3 g/day and 6 g/day groups, until the assigned dose was reached.

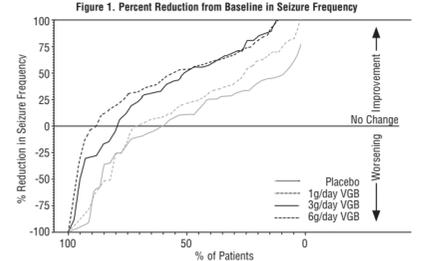
Results for the primary measure of effectiveness, reduction in monthly frequency of complex partial seizures, are shown in Table 8. The 3 g/day and 6 g/day dose groups were statistically significantly superior to placebo, but the 6 g/day dose was not superior to the 3 g/day dose.

	N	Baseline	End-study
Placebo	45	9.0	8.8
1 g/day vigabatrin	45	8.5	7.7
3 g/day vigabatrin	41	8.5	3.7*
6 g/day vigabatrin	43	8.5	4.5*

*p<0.05 compared to placebo

*Including one patient with simple partial seizures with secondary generalization only

Figure 1 presents the percentage of patients (X-axis) with a percent reduction in seizure frequency (responder rate) from baseline to the maintenance phase at least as great as that represented on the Y-axis. A positive value on the Y-axis indicates an improvement from baseline (i.e., a decrease in complex partial seizure frequency), while a negative value indicates a worsening from baseline (i.e., an increase in complex partial seizure frequency). Thus, in a display of this type, a curve for an effective treatment is shifted to the left of the curve for placebo. The proportion of patients achieving any particular level of reduction in complex partial seizure frequency was consistently higher for the vigabatrin 3 and 6 g/day groups compared to the placebo group. For example, 51% of patients randomized to vigabatrin 3 g/day and 53% of patients randomized to vigabatrin 6 g/day experienced a 50% or greater reduction in seizure frequency, compared to 9% of patients randomized to placebo. Patients with an increase in seizure frequency greater than 100% are represented on the Y-axis as equal to or greater than –100%.



Study 2

Study 2 (N=183 randomized, 182 evaluated for efficacy) was a randomized, double-blind, placebo-controlled, parallel study consisting of an 8-week baseline period and a 16-week treatment period. During the first 4 weeks following randomization, the dose of vigabatrin was titrated upward beginning with 1 g/day and increased by 0.5 g/day on a weekly basis to the maintenance dose of 3 g/day.

Results for the primary measure of effectiveness, reduction in monthly complex partial seizure frequency, are shown in Table 9. Vigabatrin 3 g/day was statistically significantly superior to placebo in reducing seizure frequency.

	N	Baseline	End-study
Placebo	90	9.0	7.5
3 g/day			