

## FOR IMMEDIATE RELEASE

**Avion Pharmaceuticals, LLC, an Alora Pharmaceuticals company, announces the FDA approval and availability of DHIVY™ for the treatment of Parkinson's disease**

*Parkinson's Disease Treatment is the First and Only Carbidopa/Levodopa (CD/LD) Tablet  
Designed to be Divided for Precise Dosing*

**ALPHARETTA, Ga. — February 14, 2022** — Avion Pharmaceuticals, LLC, an Alora Pharmaceuticals company, announced the commercial launch of DHIVY, the first and only carbidopa/levodopa (CD/LD) fractionated tablet designed to be divided. Avion gained approval for DHIVY from the FDA in November 2021. This unique design enables more precise medication dosing and directly addresses a market need to assist in titration for the gold standard commonly used by those with Parkinson's Disease (PD), the fastest-growing neurological condition in the United States, for which there is currently no cure.

DHIVY was developed by two neurologists who recognized the need for a CD/LD tablet that could be easily individualized. The fractionated tablet technology is designed with deep scores that enable patients to divide it precisely to match their recommended dose. Each tablet's four segments contain 6.25/25 mg of CD/LD—the smallest, precise dose available in today's market. The American Academy of Neurology (AAN) in its updated treatment guidelines for early Parkinson's disease recommends initiating patients with the lowest effective dose of immediate-release carbidopa/levodopa.

"Fine tuning each individual's optimal CD/LD dose in increments of less than 50 mg of levodopa is extremely unreliable. The option to accurately and reliably fractionate the CD/LD dose in 6.25/25 mg increments provides physicians and patients with the long-overdue possibility to better personalize PD management," said Dr. Leo Verhagen Metman, MD, Rush University Medical Group. "This can be helpful not only for brittle patients who aim to navigate the rocky road of motor fluctuations and dyskinesia, but also for those with milder disease who want to take no more CD/LD than strictly needed."

From 1990 to 2016, the global burden of PD has more than doubled. In the United States alone, there were 1.04 million individuals with PD in 2017, with projected prevalence of 1.64 million individuals by 2037. While CD/LD is the gold standard, and has been the leading treatment for PD, many CD/LD-treated patients report difficulty managing off-time and side effects as a result of difficulties with optimal and precise dosing of the medication. This can lead to complications such as dyskinesia, which can occur when a patient has taken too much CD/LD, or off-episodes that can result in temporary paralysis.

"While no two patients with Parkinson's Disease are the same, the burden all patients face is significant. Avion is pleased to bring DHIVY to the market to help these patients and their providers better manage CD/LD dosing needs with a more individualized experience," stated Harold "Art" Deas, Chief Executive Officer of Alora Pharmaceuticals. "The innovative tablet design provides a new way to individualize every dose and mitigate some of the challenges patients currently face when it comes to their medication management."

The company expects DHIVY will be commercially available at retail pharmacies as of Monday, February 14th, 2022. For more info about DHIVY, Please visit [dhivy.com](http://dhivy.com).

### **About Alora Pharmaceuticals, LLC**

Alora Pharmaceuticals, LLC and its family of companies are focused on improving the quality of patient lives. Everyday healthcare providers, caregivers and patients rely upon Alora to deliver a comprehensive portfolio of branded and generic medicines that address important medical needs in women's health, endocrinology, neurology, dermatology and pediatrics among others.

### **About Avion Pharmaceuticals, LLC**

Avion Pharmaceuticals, LLC, is a specialty pharmaceutical company formed to develop, acquire and market a portfolio of innovative pharmaceutical products in the Women's Health, Neurology and other therapeutic categories aligned with our mission to improve the quality of patient lives. Avion Pharmaceuticals focuses on identifying opportunities to develop, acquire and enhance the market potential of innovative, commercially available therapeutics and late-stage development drugs to fulfill unmet medical needs. For additional information about Avion Pharmaceuticals, please contact the company at 888-612-8466. For more information, visit [www.avionrx.com/](http://www.avionrx.com/).

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# Dhivy<sup>TM</sup>

(carbidopa/levodopa)

Segments 6.25 mg/25 mg | Tablets 25 mg/100 mg

## Q1 2022 PRESS KIT

# MADE TO BE BROKEN<sup>TM1</sup>

Introducing DHIVY<sup>TM</sup>—**the first and only functionally fractionated** carbidopa/levodopa (CD/LD) tablet<sup>1,2</sup>

For more information, contact customer service at 888-612-8466

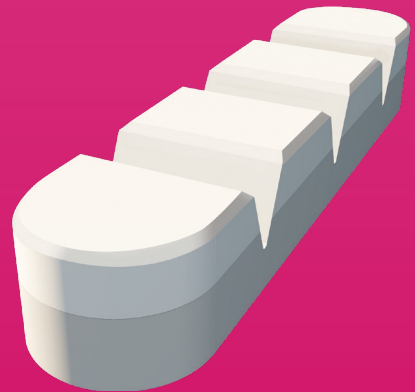


Image does *not* represent the actual size of the tablet.

## HIGHLIGHTS OF PRESCRIBING INFORMATION

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

**DHIVY (carbidopa and levodopa) tablets, for oral use**  
**Initial U.S. Approval: 1975**

### INDICATIONS AND USAGE

DHIVY is a combination of carbidopa (an aromatic amino acid decarboxylation inhibitor) and levodopa (an aromatic amino acid) indicated for the treatment of Parkinson's disease, post-encephalitic parkinsonism, and symptomatic parkinsonism that may follow carbon monoxide intoxication or manganese intoxication (1)

### DOSAGE AND ADMINISTRATION

- The recommended starting dosage of DHIVY is one 25 mg /100 mg tablet taken orally three times a day. (2.1)
- Dosage may be increased by up to one whole tablet every day or every other day, as needed, until a maximum dosage of eight whole tablets of DHIVY a day is reached. (2.1)
- Swallow DHIVY with or without food. (2.3)

### DOSAGE FORMS AND STRENGTHS

Tablets: Carbidopa and levodopa 25 mg/100 mg, functionally scored. Each DHIVY tablet has 3 functional scores with each segment containing 6.25 mg of carbidopa and 25 mg of levodopa. (3)

### CONTRAINDICATIONS

- Nonselective MAO inhibitors (4)
- With known hypersensitivity to any component of DHIVY (4)

### WARNINGS AND PRECAUTIONS

- May cause falling asleep during activities of daily living (5.1)
- Avoid sudden discontinuation or rapid dose reduction to reduce the risk of withdrawal-emergent hyperpyrexia and confusion (5.2)
- Cardiovascular Ischemic Events: Monitor patients with a history of cardiovascular disease (5.3)
- Hallucinations/Psychosis may occur (5.4)
- Impulse Control/Compulsive Behaviors: Consider dose reduction or stopping DHIVY if impulse control disorders occur (5.5)
- May cause or exacerbate dyskinesia: Consider dose reduction (5.6)

### ADVERSE REACTIONS

The most common adverse reactions reported with carbidopa/levodopa tablets have included dyskinesias, such as choreiform, dystonic, and other involuntary movements, and nausea (6)

**To report SUSPECTED ADVERSE REACTIONS, contact Avion Pharmaceuticals at 1-800-612-8466 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).**

### DRUG INTERACTIONS

Iron salts and dopamine D<sub>2</sub> antagonists including metoclopramide: May reduce the effectiveness of DHIVY (7.2, 7.3)

### USE IN SPECIFIC POPULATIONS

Pregnancy: Based on animal data, may cause fetal harm (8.1)

**See 17 for PATIENT COUNSELING INFORMATION.**

**Revised: 09/2021**

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## **FULL PRESCRIBING INFORMATION**

### **1 INDICATIONS AND USAGE**

DHIVY is indicated for the treatment of Parkinson's disease, post-encephalitic parkinsonism, and symptomatic parkinsonism that may follow carbon monoxide intoxication or manganese intoxication.

### **2 DOSAGE AND ADMINISTRATION**

#### **2.1 Initial Dosage and Maintenance of Therapy**

The recommended starting dosage of DHIVY is one 25 mg / 100 mg tablet taken orally three times a day. This dosage schedule provides 75 mg of carbidopa per day. Dosage may be increased by up to one whole tablet every day or every other day, as needed to a maximum daily dosage of eight whole tablets.

Dosing with DHIVY should be individualized and adjusted according to clinical response and tolerability. The tablet is functionally scored to facilitate dose adjustment. At least 70 mg to 100 mg of carbidopa per day should be provided. Experience with total daily dosages of carbidopa greater than 200 mg is limited.

Monitor patients closely during the dose adjustment period. Specifically, involuntary movements may occur with DHIVY, which may require dosage reduction. Blepharospasm may be a useful early sign of excess dosage in some patients.

Maintain patients on the lowest dosage required to achieve symptomatic control and to minimize adverse reactions, such as dyskinesia and nausea.

#### **2.2 Discontinuation of DHIVY**

Avoid sudden discontinuation or rapid dose reduction of DHIVY. The daily dosage of DHIVY should be tapered at the time of treatment discontinuation [*see Warnings and Precautions (5.2)*].

If general anesthesia is required, DHIVY may be continued as long as the patient is permitted to take fluids and medication by mouth. If therapy is interrupted temporarily, the patient should be observed for symptoms resembling neuroleptic malignant syndrome, and the usual daily dosage may be administered as soon as the patient is able to take oral medication.

#### **2.3 Administration Information**

Swallow DHIVY with or without food. The patient should be advised that a change in diet to foods that are high in protein may delay the absorption of levodopa and may reduce the amount taken up in the circulation. Excessive acidity also delays stomach emptying, thus delaying the absorption of levodopa.

If the patient has difficulty swallowing the tablet due to its size, the tablet can be broken at the score lines.

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

DHIVY tablets are white to off-white tablets containing 25 mg of carbidopa and 100 mg of levodopa. Each DHIVY tablet has 3 functional scores with each segment containing 6.25 mg of carbidopa and 25 mg of levodopa.

### **4 CONTRAINDICATIONS**

DHIVY is contraindicated in patients

- Currently taking a nonselective monoamine oxidase (MAO) inhibitor (e.g., phenelzine, linezolid, and tranylcypromine) or have recently (within 2 weeks) taken a nonselective MAO inhibitor. Hypertension can occur if these drugs are used concurrently [*see Drug Interactions (7.1)*].
- With known hypersensitivity to any component of DHIVY [*see Adverse Reactions (6)*].

### **5 WARNINGS AND PRECAUTIONS**

#### **5.1 Falling Asleep During Activities of Daily Living and Somnolence**

Patients taking carbidopa/levodopa alone or with other dopaminergic drugs have reported suddenly falling asleep without prior warning of sleepiness while engaged in activities of daily living, including the operation of motor vehicles which have resulted in accidents. Although many patients reported somnolence while on dopaminergic medications, some perceived that they had no warning signs (sleep attack), such as excessive drowsiness, and believed that they were alert immediately prior to the event. Sudden onset of sleep has been reported to occur more than one year after the initiation of treatment.

It has been reported that falling asleep while engaged in activities of daily living usually occurs in a setting of pre-existing somnolence, although some patients may not give such a history. For this reason, prescribers should reassess patients for drowsiness or sleepiness in DHIVY-treated patients, especially since some of the events occur well after the start of treatment. Prescribers should be aware that patients may not acknowledge drowsiness or sleepiness until directly questioned about drowsiness or sleepiness during specific activities.

Before initiating treatment with DHIVY, advise patients about the potential to develop drowsiness and ask specifically about factors that may increase the risk for somnolence with DHIVY such as the use of concomitant sedating medications and the presence of sleep disorders. Consider discontinuing DHIVY in patients who report significant daytime sleepiness or episodes of falling asleep during activities that require active participation (e.g., conversations, eating, etc.). If treatment with DHIVY continues, advise patients not to drive and to avoid other

potentially dangerous activities that might result in harm if the patients become somnolent. There is insufficient information to establish that dose reduction will eliminate episodes of falling asleep while engaged in activities of daily living.

## **5.2 Withdrawal-Emergent Hyperpyrexia and Confusion**

A symptom complex that resembles neuroleptic malignant syndrome (characterized by elevated temperature, muscular rigidity, altered consciousness, and autonomic instability), with no other obvious etiology, has been reported in association with rapid dose reduction, withdrawal of, or changes in dopaminergic therapy. Avoid sudden discontinuation or rapid dose reduction in patients taking DHIVY. If the decision is made to discontinue DHIVY, the dose should be tapered to reduce the risk of hyperpyrexia and confusion [*see Dosage and Administration (2.2)*].

## **5.3 Cardiovascular Ischemic Events**

In patients with a history of myocardial infarction who have residual atrial, nodal, or ventricular arrhythmias, cardiac function should be monitored in an intensive cardiac care facility during the period of initial dosage adjustment.

## **5.4 Hallucinations/Psychotic-Like Behavior**

Hallucinations and psychotic-like behavior have been reported with dopaminergic medications. In general, hallucinations present shortly after the initiation of therapy and may be responsive to dose reduction in levodopa. Hallucinations may be accompanied by confusion, sleep disorder (insomnia), and excessive dreaming.

Abnormal thinking and behavior may present with one or more symptoms, including paranoid ideation, delusions, hallucinations, confusion, psychotic-like behavior, disorientation, aggressive behavior, agitation, and delirium.

Patients with a major psychotic disorder should not be treated with DHIVY, because of the risk of exacerbating psychosis. In addition, medications that antagonize the effects of dopamine used to treat psychosis may exacerbate the symptoms of Parkinson's disease and may decrease the effectiveness of DHIVY [*see Drug Interactions (7.2)*].

## **5.5 Impulse Control/Compulsive Behaviors**

Case reports suggest that patients can experience an intense urge to gamble, increased sexual urges, intense urges to spend money, binge eating, and/or other intense urges, and the inability to control these urges while taking one or more of the medications, including DHIVY, that increase central dopaminergic tone and that are generally used for the treatment of Parkinson's disease. In some cases, although not all, these urges were reported to have stopped when the dosage was reduced or the medication was discontinued.

Because patients may not recognize these behaviors as abnormal, it is important for prescribers to specifically ask patients or the caregivers about the development of new or increased gambling urges, sexual urges, uncontrolled spending, or other urges while being treated with DHIVY. Consider dosage reduction or stopping the medication if a patient develops such urges while taking DHIVY.

### **5.6 Dyskinesia**

DHIVY can cause dyskinesias that may require a dosage reduction of DHIVY or other medications used for the treatment of Parkinson's disease.

### **5.7 Peptic Ulcer Disease**

Treatment with DHIVY may increase the possibility of upper gastrointestinal hemorrhage in patients with a history of peptic ulcer.

### **5.8 Glaucoma**

DHIVY may cause increased intraocular pressure in patients with glaucoma. Monitor intraocular pressure in patients with glaucoma after starting DHIVY.

### **5.9 Laboratory Tests**

DHIVY may cause a positive Coombs test or false-positive reaction for urinary ketone bodies when a test tape is used for determination of ketonuria. This reaction will not be altered by boiling the urine specimen. False-negative tests may result with the use of glucose-oxidase methods of testing for glucosuria.

Cases of falsely diagnosed pheochromocytoma in patients on carbidopa-levodopa therapy have been reported. Caution should be exercised when interpreting the plasma and urine levels of catecholamines and their metabolites in patients on carbidopa levodopa therapy.

### **5.10 Depression/Suicidality**

All patients taking DHIVY should be observed carefully for the development of depression with concomitant suicidal tendencies.

## **6 ADVERSE REACTIONS**

The following serious adverse reactions are discussed below and elsewhere in the labeling:

- Falling Asleep During Activities of Daily Living and Somnolence [*see Warnings and Precautions (5.1)*]
- Withdrawal-Emergent Hyperpyrexia and Confusion [*see Warnings and Precautions (5.2)*]
- Cardiovascular Ischemic Events [*see Warnings and Precautions (5.3)*]



- Hallucinations/Psychotic-Like Behavior [*see Warnings and Precautions (5.4)*]
- Impulse Control/Compulsive Behaviors [*see Warnings and Precautions (5.5)*]
- Dyskinesia [*see Warnings and Precautions (5.6)*]
- Peptic Ulcer Disease [*see Warnings and Precautions (5.7)*]
- Glaucoma [*see Warnings and Precautions (5.8)*]
- Depression//Suicidality [*see Warnings and Precautions (5.10)*]

The most common adverse reactions reported with carbidopa/levodopa tablets have included dyskinesias, such as choreiform, dystonic, and other involuntary movements, and nausea.

The following other adverse reactions have been reported with carbidopa/levodopa tablets:

*Body as a Whole*

Chest pain, asthenia.

*Cardiovascular*

Cardiac irregularities, hypotension, orthostatic effects including orthostatic hypotension, hypertension, syncope, phlebitis, palpitation.

*Gastrointestinal*

Dark saliva, gastrointestinal bleeding, development of duodenal ulcer, anorexia, vomiting, diarrhea, constipation, dyspepsia, dry mouth, taste alterations.

*Hematologic*

Agranulocytosis, hemolytic and non-hemolytic anemia, thrombocytopenia, leukopenia.

*Hypersensitivity*

Angioedema, urticaria, pruritus, Henoch-Schönlein purpura, bullous lesions (including pemphigus-like reactions).

*Musculoskeletal*

Back pain, shoulder pain, muscle cramps.

*Nervous System/Psychiatric*

Psychotic episodes including delusions, hallucinations, and paranoid ideation, bradykinetic episodes (“on-off” phenomenon), confusion, agitation, dizziness, somnolence, dream abnormalities including nightmares, insomnia, paresthesia, headache, depression with or without development of suicidal tendencies, dementia, pathological gambling, increased libido including hypersexuality, impulse control symptoms. Convulsions also have occurred; however, a causal relationship with DHIVY has not been established.

*Respiratory*

Dyspnea, upper respiratory infection.

*Skin*

Rash, increased sweating, alopecia, dark sweat.

#### *Urogenital*

Urinary tract infection, urinary frequency, dark urine.

#### *Laboratory Tests*

Decreased hemoglobin and hematocrit; abnormalities in alkaline phosphatase, SGOT (AST), SGPT (ALT), LDH, bilirubin, BUN, Coombs test; elevated serum glucose; white blood cells, bacteria, and blood in the urine.

Other adverse reactions that have been reported with levodopa alone and with various carbidopa levodopa formulations, and may occur with DHIVY are:

#### *Body as a Whole*

Abdominal pain and distress, fatigue.

#### *Cardiovascular*

Myocardial infarction.

#### *Gastrointestinal*

Gastrointestinal pain, dysphagia, sialorrhea, flatulence, bruxism, burning sensation of the tongue, heartburn, hiccups.

#### *Metabolic*

Edema, weight gain, weight loss.

#### *Musculoskeletal*

Leg pain.

#### *Nervous System/Psychiatric*

Ataxia, extrapyramidal disorder, falling, anxiety, gait abnormalities, nervousness, decreased mental acuity, memory impairment, disorientation, euphoria, blepharospasm (which may be taken as an early sign of excess dosage; consideration of dosage reduction may be made at this time), trismus, increased tremor, numbness, muscle twitching, activation of latent Horner's syndrome, peripheral neuropathy.

#### *Respiratory*

Pharyngeal pain, cough.

#### *Skin*

Malignant melanoma, flushing.

#### *Special Senses*

Oculogyric crises, diplopia, blurred vision, dilated pupils.

### *Urogenital*

Urinary retention, urinary incontinence, priapism.

### *Miscellaneous*

Bizarre breathing patterns, faintness, hoarseness, malaise, hot flashes, sense of stimulation.

## **7 DRUG INTERACTIONS**

### **7.1 Monoamine Oxidase (MAO) Inhibitors**

The use of nonselective MAO inhibitors with DHIVY is contraindicated [*see Contraindications (4)*]. Discontinue use of any nonselective MAO inhibitors at least two weeks prior to initiating DHIVY.

DHIVY may be administered concomitantly with the manufacturer's recommended dose of selective MAO-B inhibitors (e.g., rasagiline or selegiline HCl). Concomitant therapy with selegiline and carbidopa/levodopa may be associated with severe orthostatic hypotension not attributable to carbidopa/levodopa alone.

### **7.2 Dopamine D<sub>2</sub> Receptor Antagonists and Isoniazid**

Dopamine D<sub>2</sub> receptor antagonists (e.g., phenothiazines, butyrophenones, risperidone) and isoniazid may reduce the effectiveness of levodopa. Monitor patients taking these drugs with DHIVY for worsening Parkinson's symptoms.

### **7.3 Iron Salts**

Iron salts or multivitamins containing iron salts can form chelates with levodopa and carbidopa and can cause a reduction in the bioavailability of DHIVY. If iron salts or multivitamins containing iron salts are co-administered with DHIVY, monitor patients for worsening Parkinson's symptoms.

### **7.4 Antihypertensive Drugs**

Symptomatic postural hypotension occurred when carbidopa/levodopa was added to the treatment of a patient receiving antihypertensive drugs. Therefore, when therapy with DHIVY is started, dosage adjustment of the antihypertensive drug may be required.

### **7.5 Dopamine-Depleting Agents**

Use of DHIVY with dopamine-depleting agents (e.g., reserpine and tetrabenazine) or other drugs known to deplete monoamine stores is not recommended.

### **7.6 Metoclopramide**

Although metoclopramide may increase the bioavailability of levodopa by increasing gastric emptying, metoclopramide may also reduce effectiveness of levodopa by its dopamine receptor antagonistic properties.

## **8 USE IN SPECIFIC POPULATIONS**

### **8.1 Pregnancy**

#### Risk Summary

There are no adequate data on the developmental risk associated with the use of DHIVY in pregnant women. In animal studies, carbidopa/levodopa has been shown to be developmentally toxic (including teratogenic effects) at clinically relevant doses (*see Data*).

The estimated background risk of major birth defects and miscarriage in the indicated population is unknown. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2% to 4% and 15% to 20%, respectively.

#### Data

##### *Animal Data*

When administered to pregnant rabbits throughout organogenesis, carbidopa-levodopa caused both visceral and skeletal malformations in fetuses at all doses and ratios of carbidopa-levodopa tested. No teratogenic effects were observed when carbidopa-levodopa was administered to pregnant mice throughout organogenesis.

### **8.2 Lactation**

#### Risk Summary

Levodopa has been detected in human milk after administration of carbidopa-levodopa. There are no data on the presence of carbidopa in human milk, the effects of levodopa or carbidopa on the breastfed infant, or the effects on milk production. However, inhibition of lactation may occur because levodopa decreases secretion of prolactin in humans.

The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for DHIVY and any potential adverse effects on the breastfed infant from DHIVY or from the underlying maternal condition.

### **8.4 Pediatric Use**

Safety and effectiveness in pediatric patients have not been established.

## 8.5 Geriatric Use

Of the total number of subjects in clinical studies of immediate-release carbidopa-levodopa tablets (i.e., Sinemet<sup>®</sup>), almost half of the patients were older than age 65 years, and few were age 75 years and over. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, but greater sensitivity of some older individuals to adverse drug reactions such as hallucinations cannot be ruled out.

The systemic exposure of levodopa was increased in elderly subjects compared to young subjects [see *Clinical Pharmacology (12.3)*]. There is no specific dosing recommendation based upon clinical pharmacology data as carbidopa/levodopa is titrated as tolerated for clinical effect.

## 10 OVERDOSAGE

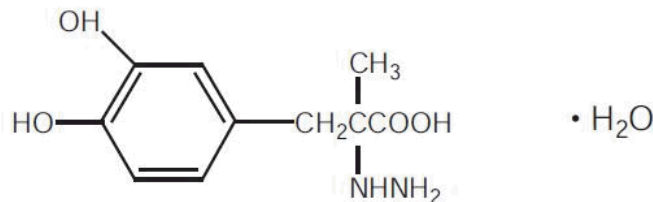
Based on the limited available information, the acute symptoms of levodopa/dopa decarboxylase inhibitor overdosage can be expected to arise from dopaminergic overstimulation. Doses of a few grams may result in CNS disturbances, with an increasing likelihood of cardiovascular disturbance (e.g., hypotension, tachycardia) and more severe psychiatric problems at higher doses. An isolated report of rhabdomyolysis and another of transient renal insufficiency suggest that levodopa overdosage may give rise to systemic complications, secondary to dopaminergic overstimulation.

Monitor patients and provide supportive care. Patients should receive electrocardiographic monitoring for the development of arrhythmias; if needed, appropriate antiarrhythmic therapy should be given. The possibility that the patient may have taken other drugs, increasing the risk of drug interactions (especially catechol-structured drugs) should be taken into consideration.

## 11 DESCRIPTION

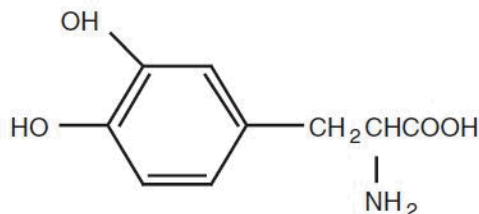
DHIVY<sup>®</sup> (carbidopa levodopa) is a combination of carbidopa, an inhibitor of aromatic amino acid decarboxylation, and levodopa, an aromatic amino acid, in tablets for oral use.

Carbidopa is a white, crystalline compound, slightly soluble in water, with a molecular weight of 244.3. It is designated chemically as (-)-L- $\alpha$ -hydrazino- $\alpha$ -methyl- $\beta$ -(3,4-dihydroxy-benzene) propanoic acid monohydrate. It has a pKa of 2.3. Its molecular formula is C<sub>10</sub>H<sub>14</sub>N<sub>2</sub>O<sub>4</sub>•H<sub>2</sub>O and its structural formula is:



Tablet content is expressed in terms of anhydrous carbidopa, which has a molecular weight of 226.3.

Levodopa is a white, crystalline compound, slightly soluble in water, with a molecular weight of 197.2. It is designated chemically as (-)-L- $\alpha$ -amino- $\beta$ -(3,4-dihydroxybenzene) propanoic acid. It has a pKa of 2.32. Its molecular formula is C<sub>9</sub>H<sub>11</sub>NO<sub>4</sub> and its structural formula is:



DHIVY is supplied as tablets for oral administration containing 25 mg of carbidopa and 100 mg of levodopa. The inactive ingredients are magnesium stearate, microcrystalline cellulose, and pregelatinized starch.

## 12 CLINICAL PHARMACOLOGY

### 12.1 Mechanism of Action

#### Carbidopa

When levodopa is administered orally, it is rapidly decarboxylated to dopamine in extracerebral tissues so that only a small portion of a given dose is transported unchanged to the central nervous system. Carbidopa inhibits the decarboxylation of peripheral levodopa, making more levodopa available for delivery to the brain.

#### Levodopa

Levodopa is the metabolic precursor of dopamine, does cross the blood-brain barrier, and presumably is converted to dopamine in the brain. This is thought to be the mechanism whereby levodopa treats symptoms of Parkinson's disease.

### 12.2 Pharmacodynamics

Because its decarboxylase inhibiting activity is limited to extracerebral tissues, administration of carbidopa with levodopa makes more levodopa available to the brain. Carbidopa does not cross the blood-brain barrier and does not affect the metabolism of levodopa within the central nervous system. The addition of carbidopa to levodopa reduces the peripheral effects (nausea, vomiting) due to decarboxylation of levodopa; however, carbidopa does not decrease the adverse reactions due to the central effects of levodopa.

Patients treated with levodopa therapy for Parkinson's disease may develop motor fluctuations characterized by end-of-dose failure, peak dose dyskinesia, 'on-off' phenomenon, and akinesia.

### **12.3 Pharmacokinetics**

Following single oral administration of a DHIVY tablet, DHIVY was shown to be bioequivalent to an immediate-release carbidopa/levodopa 25/100 mg tablet under fasting conditions for both carbidopa and levodopa.

#### Absorption

Following oral dosing of DHIVY under fasted conditions, the maximum concentration occurred at 3 hours for carbidopa and 1 hour for levodopa. The exposure of DHIVY after dose fractionation is proportional.

#### *Effect of Food*

In healthy adults, oral administration of DHIVY after a high-fat, high-calorie meal reduced levodopa  $C_{max}$  by approximately 25% while the AUC remained unchanged. The peak concentration of both carbidopa/levodopa were observed approximately 30 minutes later when DHIVY is taken with a high-fat, high-calorie meal.

Since levodopa competes with certain amino acids for transport across the gut wall, the absorption of levodopa may be impaired in some patients on a high protein diet [*see Dosage and Administration (2.3)*].

#### Distribution

Carbidopa is approximately 36% bound to plasma proteins. Levodopa is approximately 10% to 30% bound to plasma proteins.

#### Elimination

Following oral dosing of DHIVY under fasted conditions, the half-life was reported at approximately 3.5 hours for carbidopa and 2 hours for levodopa.

In clinical pharmacologic studies, simultaneous administration of carbidopa and levodopa produced greater urinary excretion of levodopa in proportion to the excretion of dopamine than administration of the two drugs at separate times.

#### Specific Populations

##### *Geriatric Patients*

A study in eight young healthy subjects (21-22 years) and eight elderly healthy subjects (69-76 years) showed that the absolute bioavailability of levodopa was similar between young and elderly subjects following oral administration of levodopa and carbidopa. However, the systemic exposure (AUC) of levodopa was increased by 55% in elderly subjects compared to young subjects. Based on another study in forty patients with Parkinson's disease, there was a correlation between age of patients and the increase of AUC of levodopa following administration of levodopa and an inhibitor of peripheral dopa decarboxylase. AUC of levodopa was increased by 28% in elderly patients ( $\geq 65$  years) compared to young patients ( $< 65$  years). Additionally, mean value of  $C_{\max}$  for levodopa was increased by 24% in elderly patients ( $\geq 65$  years) compared to young patients ( $< 65$  years) [see Use in Specific Populations (8.5)].

The AUC of carbidopa was increased in elderly subjects (n=10, 65-76 years) by 29% compared to young subjects (n=24, 23-64 years) following IV administration of 50 mg levodopa with carbidopa (50 mg). This increase is not considered to have a clinically significant impact.

## **13 NONCLINICAL TOXICOLOGY**

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

#### Carcinogenesis

In rats, oral administration of carbidopa-levodopa for two years resulted in no evidence of carcinogenicity.

#### Impairment of Fertility

In reproduction studies, no effects on fertility were observed in rats receiving carbidopa-levodopa.

## **14 CLINICAL STUDIES**

The efficacy of DHIVY is based upon bioavailability studies comparing DHIVY to an immediate-release tablet containing 25 mg of carbidopa and 100 mg of levodopa [see Clinical Pharmacology (12.3)].

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

### **16.1 How Supplied**

DHIVY (carbidopa and levodopa) tablets are white to off-white tablets with functional scoring containing 25 mg of carbidopa and 100 mg of levodopa. One side of each DHIVY tablet has 3 scores, with each segment containing 6.25 mg of carbidopa and 25 mg of levodopa (1:4 ratio). The unscored side of the tablet is debossed with logo "AV701".

DHIVY is supplied as follows:



NDC 75854-701-01 bottles of 100.

## 16.2 Storage and Handling

Store at 20°C to 25°C (68°F to 77°F); excursions permitted between 15°C to 30°C (59°F to 86°F) [see USP Controlled Room Temperature]. Store in a tightly closed container, protected from light and moisture.

Dispense in a light-resistant container.

## 17 PATIENT COUNSELING INFORMATION

### Dosing Instructions

- It is important that DHIVY be taken at regular intervals according to the schedule outlined by their physician. Inform the patient not to change the prescribed dosage regimen and not to add any additional antiparkinson medications, including other carbidopa-levodopa preparations, without first consulting their physician. Advise patients to call their healthcare provider before stopping DHIVY. Discontinue DHIVY slowly. Tell patients to call their healthcare provider if they develop withdrawal symptoms such as fever and confusion [*see Dosage and Administration (2.2) and Warnings and Precautions (5.2)*].
- Advise patients to swallow DHIVY with or without food. If the patient has difficulty swallowing the tablet due to its size, inform the patient that the tablet can be broken at the score lines [*see Dosage and Administration (2.3)*].
- Advise the patient that occasionally, dark color (red, brown, or black) may appear in saliva, urine, or sweat after ingestion of DHIVY. Although the color appears to be clinically insignificant, garments may become discolored.
- Advise the patient that a change in diet to foods that are high in protein or taking iron salts or multivitamins with iron may delay the absorption of levodopa and may reduce the amount taken up in the circulation. Excessive acidity also delays stomach emptying, thus delaying the absorption of levodopa.

### Falling Asleep

Advise patients that certain side effects such as sleepiness and dizziness that have been reported with DHIVY may affect some patients' ability to drive and operate machinery safely [*see Warnings and Precautions (5.1) and Adverse Reactions (6)*].

### Hallucinations and Psychosis

Inform patients that hallucinations can occur with levodopa products [*see Warnings and Precautions (5.4)*].

### Impulse Control Disorder

Inform patients of the potential for experiencing intense urges to gamble, increased sexual urges, and other intense urges and the inability to control these urges while taking one or more of the medications that increase central dopaminergic tone, that are generally used for the treatment of Parkinson's disease [*see Warnings and Precautions (5.5)*].

### Dyskinesia

Instruct patients to notify their healthcare provider if abnormal involuntary movements appear or get worse during treatment with DHIVY [*see Warnings and Precautions (5.6)*].

### Pregnancy and Breastfeeding

Advise patients to notify their healthcare provider if they become pregnant or intend to become pregnant during DHIVY therapy [*see Use in Specific Populations (8.1)*].

Advise female patients to notify their physicians if they intend to breastfeed or are breastfeeding an infant [*see Use in Specific Populations (8.2)*].

Distributed by:  
Avion Pharmaceuticals, LLC  
Alpharetta, GA, 30005 USA  
L-0340 Rev. 0921-01

U.S. Patent 11,033,521

**Dhivy**<sup>™</sup>  
(carbidopa/levodopa)

Segments 6.25 mg/25 mg | Tablets 25 mg/100 mg

# NOW AVAILABLE FOR PARKINSON'S DISEASE<sup>1</sup>

- DHIVY is the first and only functionally fractionated CD/LD tablet
- DHIVY is a combination of carbidopa and levodopa indicated for the treatment of Parkinson's disease, post-encephalitic parkinsonism, and symptomatic parkinsonism that may follow carbon monoxide intoxication or manganese intoxication
- DHIVY has functional scores to facilitate dose adjustment

## A precise, easy-to-individualize dose to suit each patient's needs

Adjust dose according to the desired  
therapeutic response

**Developed by 2 neurologists  
using bilayered tablet design**  
Top layer is CD/LD and bottom  
layer is drug free

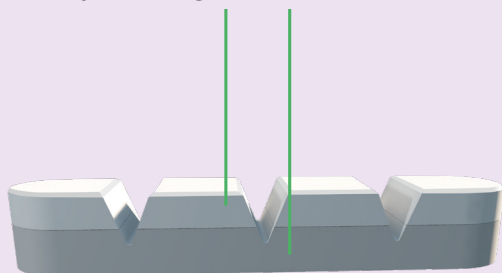


Image does *not* represent the actual size of the tablet.

## Functional scores to facilitate dose adjustment when needed

Each segment contains  
6.25/25 mg—the smallest  
available within a tablet



**1 whole tablet** (25/100 mg)



**3/4 tablet** (18.75/75 mg)



**1/2 tablet** (12.5/50 mg)



**1/4 tablet** (6.25/25 mg)

The smallest segment available within a  
CD/LD tablet<sup>1,2</sup>

## Dosing that suits each patient's needs

Individualize each dose  
to achieve symptomatic  
control and to minimize  
adverse reactions, such  
as dyskinesia and nausea

**Dhivy**<sup>™</sup>  
(carbidopa/levodopa)  
Tablets 25 mg/100 mg

# DHIVY SUCCESS GUIDE



This guide includes useful tips for starting DHIVY to treat Parkinson's disease, along with a progress journal to help you initiate conversations with your doctor.

Image does *not* represent the actual size of the tablet.

## **INDICATION**

DHIVY is a combination of carbidopa and levodopa indicated for the treatment of Parkinson's disease, post-encephalitic parkinsonism, and symptomatic parkinsonism that may follow carbon monoxide intoxication or manganese intoxication.

**Please see Important Safety Information throughout and accompanying full Prescribing Information.**

# DHIVY can be personalized by snapping off the desired amount

Your dose of carbidopa/levodopa (CD/LD) should be individualized to best suit you. That's why DHIVY was created: to give people with Parkinson's disease the ability to personalize their dose to fit their needs.

There are 4 different amounts available to you within each tablet:



**1 whole tablet**  
(25/100 mg)



**3/4 tablet**  
(18.75/75 mg)



**1/2 tablet**  
(12.5/50 mg)



**1/4 tablet**  
(6.25/25 mg)

Images represent the actual size of the tablet.

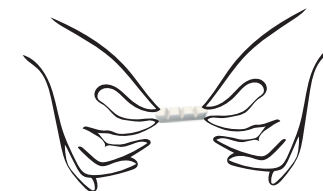
## IMPORTANT SAFETY INFORMATION

Do not take DHIVY with antidepressant medications known as nonselective monoamine oxidase (MAO) inhibitors because taking these two drugs within 2 weeks of each other can result in high blood pressure. Do not take DHIVY if you have hypersensitivity to any ingredient of DHIVY.

Please see Important Safety Information throughout and accompanying full Prescribing Information.

## How to take DHIVY

**If you need a whole tablet of DHIVY:**  
Swallow the tablet whole. If you have trouble swallowing a whole tablet, you can snap DHIVY into segments.

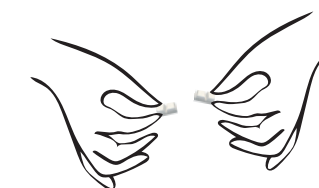


**If you need to snap DHIVY into segments:**  
Ensure you are holding the tablet in both hands, then gently push downward on each side of the tablet's groove.

**Snapping a tablet in quarters**



**Snapping a tablet in half**



Images do *not* represent the actual size of the tablet.

Store unused DHIVY in the original container or pill carrier.

## Tips for success



### Prepare for an adjustment period

Whether you're new to CD/LD or have been taking it for years, you may need a couple of weeks to find the dose of DHIVY that works best for you.



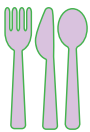
### Set a schedule

Stay on the right path by setting reminders to take DHIVY, as it must be taken at regular intervals. Be sure to take it as prescribed by your doctor.



### Keep DHIVY in a safe place

Keep all of your DHIVY tablets in one container, including partial doses. Store DHIVY at room temperature in a tightly closed container that's protected from light and moisture.



### Take anytime, anywhere

DHIVY can be taken with or without food and at any time of day. Work with your doctor to find what's best for you.



### Keep track

Record DHIVY's effects in the following journal. Your doctor knows only what you tell them, so recording these changes while they are fresh in your mind can help your doctor better understand your needs.



### Start conversations

Bring this guide to your next appointment and discuss your journal entries with your doctor.

## Record your thoughts about DHIVY



### What is the daily dose the doctor prescribed for you?

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### Has your dosing schedule changed since starting DHIVY?

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### Have you noticed any changes in your Parkinson's disease symptoms?

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### IMPORTANT SAFETY INFORMATION (continued)

Taking DHIVY may result in falling asleep while engaged in normal activities, even without warning and as late as one year or later after starting DHIVY. Do not drive or operate machinery until you know how DHIVY affects you.

**Please see Important Safety Information throughout and accompanying full Prescribing Information.**





# Important Safety Information

## (continued)

Tell your healthcare provider if you have any heart conditions, especially if you have had a heart attack or irregular heartbeats; if you experience hallucinations or abnormal thoughts and behaviors (such as excessive suspicion, believing things that are not real, confusion, agitation, aggressive behavior, and disorganized thinking); if you have intense urges to gamble, increased sexual urges, other intense urges, and the inability to control those urges; if dyskinesia or abnormal involuntary movements appear or get worse during treatment with DHIVY; if you have ever had a peptic ulcer or glaucoma; if you have any abnormal lab results; or if you experience depression or suicidal thoughts.

Notify your healthcare provider if you become pregnant or intend to become pregnant during DHIVY therapy or if you intend to breastfeed or are breastfeeding an infant.

Talk to your healthcare provider before you lower the dose or stop taking DHIVY, as this may result in serious side effects. Call your healthcare provider immediately if you develop withdrawal symptoms such as fever, confusion, or severe muscle stiffness.

Take DHIVY as instructed. You may take DHIVY with or without food. If you have difficulty swallowing the tablet due to its size, you may break the tablet along the score lines.

The most common adverse reactions reported with carbidopa/levodopa tablets have included abnormal involuntary movements and nausea.

**Please see accompanying full Prescribing Information.**