

## HIGHLIGHTS OF PRESCRIBING INFORMATION

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

VYVANSE® (lisdexamfetamine dimesylate) capsules, for oral use, CII  
VYVANSE® (lisdexamfetamine dimesylate) chewable tablets, for oral use, CII  
Initial U.S. Approval: 2007

### WARNING: ABUSE AND DEPENDENCE

See full prescribing information for complete boxed warning.

- CNS stimulants, including VYVANSE, other amphetamine-containing products, and methylphenidate have a high potential for abuse and dependence (5.1, 9.3)
- Assess the risk of abuse prior to prescribing and monitor for signs of abuse and dependence while on therapy (5.1, 9.2)

### RECENT MAJOR CHANGES

Indications and Usage (1) 7/2021  
Warnings and Precautions (5.5) 7/2021

### INDICATIONS AND USAGE

VYVANSE is a central nervous system (CNS) stimulant indicated for the treatment of (1):

- Attention Deficit Hyperactivity Disorder (ADHD) in adults and pediatric patients 6 years and older
- Moderate to severe binge eating disorder (BED) in adults

#### Limitations of Use:

- Pediatric patients with ADHD younger than 6 years of age experienced more long-term weight loss than patients 6 years and older (8.4)
- VYVANSE is not indicated for weight loss. Use of other sympathomimetic drugs for weight loss has been associated with serious cardiovascular adverse events. The safety and effectiveness of VYVANSE for the treatment of obesity have not been established (5.2)

### DOSAGE AND ADMINISTRATION

Indicated Population	Initial Dose	Titration Schedule	Recommended Dose	Maximum Dose
ADHD (Adults and pediatric patients 6 years and older) (2.2)	30 mg every morning	10 mg or 20 mg weekly	30 mg to 70 mg per day	70 mg per day
BED (Adults) (2.3)	30 mg every morning	20 mg weekly	50 mg to 70 mg per day	70 mg per day

- Prior to treatment, assess for presence of cardiac disease (2.4)
- Severe renal impairment: Maximum dose is 50 mg/day (2.5)
- End stage renal disease (ESRD): Maximum dose is 30 mg/day (2.5)

### DOSAGE FORMS AND STRENGTHS

- Capsules: 10 mg, 20 mg, 30 mg, 40 mg, 50 mg, 60 mg, 70 mg (3)
- Chewable tablets: 10 mg, 20 mg, 30 mg, 40 mg, 50 mg, 60 mg (3)

### CONTRAINDICATIONS

- Known hypersensitivity to amphetamine products or other ingredients in VYVANSE (4)
- Use with monoamine oxidase (MAO) inhibitor, or within 14 days of the last MAO inhibitor dose (4, 7.2)

### WARNINGS AND PRECAUTIONS

- **Serious Cardiovascular Reactions:** Sudden death has been reported in association with CNS stimulant treatment at recommended doses in pediatric patients with structural cardiac abnormalities or other serious heart problems. In adults, sudden death, stroke, and myocardial infarction have been reported. Avoid use in patients with known structural cardiac abnormalities, cardiomyopathy, serious heart arrhythmia, or coronary artery disease (5.2)
- **Blood Pressure and Heart Rate Increases:** Monitor blood pressure and pulse. Consider benefits and risks before use in patients for whom blood pressure increases may be problematic (5.3)
- **Psychiatric Adverse Reactions:** May cause psychotic or manic symptoms in patients with no prior history, or exacerbation of symptoms in patients with pre-existing psychosis. Evaluate for bipolar disorder prior to stimulant use (5.4)
- **Suppression of Growth:** Monitor height and weight in pediatric patients during treatment (5.5)
- **Peripheral Vasculopathy, including Raynaud's phenomenon:** Stimulants are associated with peripheral vasculopathy, including Raynaud's phenomenon. Careful observation for digital changes is necessary during treatment with stimulants (5.6)
- **Serotonin Syndrome:** Increased risk when co-administered with serotonergic agents (e.g., SSRIs, SNRIs, triptans), but also during overdosage situations. If it occurs, discontinue VYVANSE and initiate supportive treatment (4, 5.7, 10)

### ADVERSE REACTIONS

Most common adverse reactions (incidence  $\geq 5\%$  and at a rate at least twice placebo) in pediatric patients ages 6 to 17 years, and/or adults with ADHD were anorexia, anxiety, decreased appetite, decreased weight, diarrhea, dizziness, dry mouth, irritability, insomnia, nausea, upper abdominal pain, and vomiting (6.1)

Most common adverse reactions (incidence  $\geq 5\%$  and at a rate at least twice placebo) in adults with BED were dry mouth, insomnia, decreased appetite, increased heart rate, constipation, feeling jittery, and anxiety (6.1)

To report SUSPECTED ADVERSE REACTIONS, contact Takeda Pharmaceuticals at 1-800-828-2088 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).

### DRUG INTERACTIONS

**Acidifying and Alkalinizing Agents:** Agents that alter urinary pH can alter blood levels of amphetamine. Acidifying agents decrease amphetamine blood levels, while alkalinizing agents increase amphetamine blood levels. Adjust VYVANSE dosage accordingly (2.6, 7.1)

### USE IN SPECIFIC POPULATIONS

- **Pregnancy:** May cause fetal harm (8.1)
- **Lactation:** Breastfeeding not recommended (8.2)

See 17 for PATIENT COUNSELING INFORMATION and Medication Guide.

Revised: 1/2022

**FULL PRESCRIBING INFORMATION: CONTENTS\***

**WARNING: ABUSE AND DEPENDENCE**

**1 INDICATIONS AND USAGE**

**2 DOSAGE AND ADMINISTRATION**

- 2.1 Pre-treatment Screening
- 2.2 General Instructions for Use
- 2.3 Dosage for Treatment of ADHD
- 2.4 Dosage for Treatment of Moderate to Severe BED in Adults
- 2.5 Dosage in Patients with Renal Impairment
- 2.6 Dosage Modifications due to Drug Interactions

**3 DOSAGE FORMS AND STRENGTHS**

**4 CONTRAINDICATIONS**

**5 WARNINGS AND PRECAUTIONS**

- 5.1 Potential for Abuse and Dependence
- 5.2 Serious Cardiovascular Reactions
- 5.3 Blood Pressure and Heart Rate Increases
- 5.4 Psychiatric Adverse Reactions
- 5.5 Suppression of Growth
- 5.6 Peripheral Vasculopathy, including Raynaud's Phenomenon
- 5.7 Serotonin Syndrome

**6 ADVERSE REACTIONS**

- 6.1 Clinical Trials Experience
- 6.2 Postmarketing Experience

**7 DRUG INTERACTIONS**

- 7.1 Drugs Having Clinically Important Interactions with Amphetamines
- 7.2 Drugs Having No Clinically Important Interactions with VYVANSE

**8 USE IN SPECIFIC POPULATIONS**

- 8.1 Pregnancy
- 8.2 Lactation
- 8.4 Pediatric Use
- 8.5 Geriatric Use
- 8.6 Renal Impairment

**9 DRUG ABUSE AND DEPENDENCE**

- 9.1 Controlled Substance
- 9.2 Abuse
- 9.3 Dependence

**10 OVERDOSAGE**

**11 DESCRIPTION**

**12 CLINICAL PHARMACOLOGY**

- 12.1 Mechanism of Action
- 12.2 Pharmacodynamics
- 12.3 Pharmacokinetics

**13 NONCLINICAL TOXICOLOGY**

- 13.1 Carcinogenesis, Mutagenesis, and Impairment of Fertility
- 13.2 Animal Toxicology and/or Pharmacology

**14 CLINICAL STUDIES**

- 14.1 Attention Deficit Hyperactivity Disorder (ADHD)
- 14.2 Binge Eating Disorder (BED)

**16 HOW SUPPLIED/STORAGE AND HANDLING**

- 16.1 How Supplied
- 16.2 Storage and Handling

**17 PATIENT COUNSELING INFORMATION**

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

## FULL PRESCRIBING INFORMATION

### WARNING: ABUSE AND DEPENDENCE

CNS stimulants, including VYVANSE, other amphetamine-containing products, and methylphenidate, have a high potential for abuse and dependence. Assess the risk of abuse prior to prescribing and monitor for signs of abuse and dependence while on therapy [see *Warnings and Precautions (5.1)*, and *Drug Abuse and Dependence (9.2, 9.3)*].

## 1 INDICATIONS AND USAGE

VYVANSE® is indicated for the treatment of:

- Attention Deficit Hyperactivity Disorder (ADHD) in adults and pediatric patients 6 years and older [see *Clinical Studies (14.1)*]
- Moderate to severe binge eating disorder (BED) in adults [see *Clinical Studies (14.2)*].

### Limitations of Use:

- Pediatric patients with ADHD younger than 6 years of age experienced more long-term weight loss than patients 6 years and older [see *Use in Specific Populations (8.4)*].
- VYVANSE is not indicated or recommended for weight loss. Use of other sympathomimetic drugs for weight loss has been associated with serious cardiovascular adverse events. The safety and effectiveness of VYVANSE for the treatment of obesity have not been established [see *Warnings and Precautions (5.2)*].

## 2 DOSAGE AND ADMINISTRATION

### 2.1 Pre-treatment Screening

Prior to treating patients with CNS stimulants, including VYVANSE, assess for the presence of cardiac disease (e.g., a careful history, family history of sudden death or ventricular arrhythmia, and physical exam) [see *Warnings and Precautions (5.2)*].

To reduce the abuse of CNS stimulants including VYVANSE, assess the risk of abuse, prior to prescribing. After prescribing, keep careful prescription records, educate patients about abuse, monitor for signs of abuse and overdose, and re-evaluate the need for VYVANSE use [see *Warnings and Precautions (5.1)*, *Drug Abuse and Dependence (9)*].

### 2.2 General Instructions for Use

Take VYVANSE by mouth in the morning with or without food; avoid afternoon doses because of the potential for insomnia. VYVANSE may be administered in one of the following ways:

*Information for VYVANSE capsules:*

- Swallow VYVANSE capsules whole, or

- Open capsules, empty and mix the entire contents with yogurt, water, or orange juice. If the contents of the capsule include any compacted powder, a spoon may be used to break apart the powder. The contents should be mixed until completely dispersed. Consume the entire mixture immediately. It should not be stored. The active ingredient dissolves completely once dispersed; however, a film containing the inactive ingredients may remain in the glass or container once the mixture is consumed.

*Information for VYVANSE chewable tablets:*

- VYVANSE chewable tablets must be chewed thoroughly before swallowing.

VYVANSE capsules can be substituted with VYVANSE chewable tablets on a unit per unit/mg per mg basis (for example, 30 mg capsules for 30 mg chewable tablet) [see *Clinical Pharmacology* (12.3)].

Do not take anything less than one capsule or chewable tablet per day. A single dose should not be divided.

### **2.3 Dosage for Treatment of ADHD**

The recommended starting dosage in adults and pediatric patients 6 years and older is 30 mg once daily in the morning. Dosage may be adjusted in increments of 10 mg or 20 mg at approximately weekly intervals up to maximum recommended dosage of 70 mg once daily [see *Clinical Studies* (14.1)].

### **2.4 Dosage for Treatment of Moderate to Severe BED in Adults**

The recommended starting dosage in adults is 30 mg once daily to be titrated in increments of 20 mg at approximately weekly intervals to achieve the recommended target dose of 50 mg to 70 mg once daily. The maximum recommended dosage is 70 mg once daily [see *Clinical Studies* (14.2)]. Discontinue VYVANSE if binge eating does not improve.

### **2.5 Dosage in Patients with Renal Impairment**

In patients with severe renal impairment (GFR 15 to < 30 mL/min/1.73 m<sup>2</sup>), the maximum dosage should not exceed 50 mg once daily. In patients with end stage renal disease (ESRD, GFR < 15 mL/min/1.73 m<sup>2</sup>), the maximum recommended dosage is 30 mg once daily [see *Use in Specific Populations* (8.6)].

### **2.6 Dosage Modifications due to Drug Interactions**

Agents that alter urinary pH can impact urinary excretion and alter blood levels of amphetamine. Acidifying agents (e.g., ascorbic acid) decrease blood levels, while alkalinizing agents (e.g., sodium bicarbonate) increase blood levels. Adjust VYVANSE dosage accordingly [see *Drug Interactions* (7.1)].

### 3 DOSAGE FORMS AND STRENGTHS

VYVANSE (lisdexamfetamine dimesylate) *capsules*:

- Capsules 10 mg: pink body/pink cap (imprinted with S489 and 10 mg)
- Capsules 20 mg: ivory body/ivory cap (imprinted with S489 and 20 mg)
- Capsules 30 mg: white body/orange cap (imprinted with S489 and 30 mg)
- Capsules 40 mg: white body/blue green cap (imprinted with S489 and 40 mg)
- Capsules 50 mg: white body/blue cap (imprinted with S489 and 50 mg)
- Capsules 60 mg: aqua blue body/aqua blue cap (imprinted with S489 and 60 mg)
- Capsules 70 mg: blue body/orange cap (imprinted with S489 and 70 mg)

VYVANSE (lisdexamfetamine dimesylate) *chewable tablets*:

- Chewable tablets 10 mg: White to off-white round shaped tablet debossed with ‘10’ on one side and ‘S489’ on the other
- Chewable tablets 20 mg: White to off-white hexagonal shaped tablet debossed with ‘20’ on one side and ‘S489’ on the other
- Chewable tablets 30 mg: White to off-white arc triangular shaped tablet debossed with ‘30’ on one side and ‘S489’ on the other
- Chewable tablets 40 mg: White to off-white capsule shaped tablet debossed with ‘40’ on one side and ‘S489’ on the other
- Chewable tablets 50 mg: White to off-white arc square shaped tablet debossed with ‘50’ on one side and ‘S489’ on the other
- Chewable tablets 60 mg: White to off-white arc diamond shaped tablet debossed with ‘60’ on one side and ‘S489’ on the other

### 4 CONTRAINDICATIONS

VYVANSE is contraindicated in patients with:

- Known hypersensitivity to amphetamine products or other ingredients of VYVANSE. Anaphylactic reactions, Stevens-Johnson Syndrome, angioedema, and urticaria have been observed in postmarketing reports [*see Adverse Reactions (6.2)*].
- Patients taking monoamine oxidase inhibitors (MAOIs), or within 14 days of stopping MAOIs (including MAOIs such as linezolid or intravenous methylene blue), because of an increased risk of hypertensive crisis [*see Warnings and Precautions (5.7) and Drug Interactions (7.1)*].

### 5 WARNINGS AND PRECAUTIONS

#### 5.1 Potential for Abuse and Dependence

CNS stimulants, including VYVANSE, other amphetamine-containing products, and methylphenidate, have a high potential for abuse and dependence. Assess the risk of abuse prior

to prescribing, and monitor for signs of abuse and dependence while on therapy [*see Drug Abuse and Dependence (9.2, 9.3)*].

## 5.2 Serious Cardiovascular Reactions

Sudden death, stroke, and myocardial infarction have been reported in adults with CNS stimulant treatment at recommended doses. Sudden death has been reported in pediatric patients with structural cardiac abnormalities and other serious heart problems taking CNS stimulants at recommended doses for ADHD. Avoid use in patients with known structural cardiac abnormalities, cardiomyopathy, serious heart arrhythmia, coronary artery disease, and other serious heart problems. Further evaluate patients who develop exertional chest pain, unexplained syncope, or arrhythmias during VYVANSE treatment.

## 5.3 Blood Pressure and Heart Rate Increases

CNS stimulants cause an increase in blood pressure (mean increase about 2 to 4 mm Hg) and heart rate (mean increase about 3 to 6 bpm). Monitor all patients for potential tachycardia and hypertension.

## 5.4 Psychiatric Adverse Reactions

### Exacerbation of Pre-existing Psychosis

CNS stimulants may exacerbate symptoms of behavior disturbance and thought disorder in patients with a pre-existing psychotic disorder.

### Induction of a Manic Episode in Patients with Bipolar Disorder

CNS stimulants may induce a mixed/manic episode in patients with bipolar disorder. Prior to initiating treatment, screen patients for risk factors for developing a manic episode (e.g., comorbid or history of depressive symptoms or a family history of suicide, bipolar disorder, and depression).

### New Psychotic or Manic Symptoms

CNS stimulants, at recommended doses, may cause psychotic or manic symptoms (e.g., hallucinations, delusional thinking, or mania) in patients without a prior history of psychotic illness or mania. If such symptoms occur, consider discontinuing VYVANSE. In a pooled analysis of multiple short-term, placebo-controlled studies of CNS stimulants, psychotic or manic symptoms occurred in 0.1% of CNS stimulant-treated patients compared to 0% in placebo-treated patients.

## 5.5 Suppression of Growth

CNS stimulants have been associated with weight loss and slowing of growth rate in pediatric patients. Closely monitor growth (weight and height) in pediatric patients treated with CNS stimulants, including VYVANSE. In a 4-week, placebo-controlled trial of VYVANSE in pediatric patients ages 6 to 12 years old with ADHD, there was a dose-related decrease in weight in the VYVANSE groups compared to weight gain in the placebo group. Additionally, in studies of another stimulant, there was slowing of the increase in height [*see Adverse Reactions (6.1)*].



Patients who are not growing or gaining height or weight as expected may need to have their treatment interrupted. VYVANSE is not approved for use in pediatric patients below 6 years of age [see *Use in Specific Populations* (8.4)].

## **5.6 Peripheral Vasculopathy, including Raynaud's Phenomenon**

Stimulants, including VYVANSE, are associated with peripheral vasculopathy, including Raynaud's phenomenon. Signs and symptoms are usually intermittent and mild; however, very rare sequelae include digital ulceration and/or soft tissue breakdown. Effects of peripheral vasculopathy, including Raynaud's phenomenon, were observed in post-marketing reports at different times and at therapeutic doses in all age groups throughout the course of treatment. Signs and symptoms generally improve after reduction in dose or discontinuation of drug. Careful observation for digital changes is necessary during treatment with stimulants. Further clinical evaluation (e.g., rheumatology referral) may be appropriate for certain patients.

## **5.7 Serotonin Syndrome**

Serotonin syndrome, a potentially life-threatening reaction, may occur when amphetamines are used in combination with other drugs that affect the serotonergic neurotransmitter systems such as monoamine oxidase inhibitors (MAOIs), selective serotonin reuptake inhibitors (SSRIs), serotonin norepinephrine reuptake inhibitors (SNRIs), triptans, tricyclic antidepressants, fentanyl, lithium, tramadol, tryptophan, buspirone, and St. John's Wort [see *Drug Interactions* (7.1)]. The co-administration with cytochrome P450 2D6 (CYP2D6) inhibitors may also increase the risk with increased exposure to the active metabolite of VYVANSE (dextroamphetamine). In these situations, consider an alternative non-serotonergic drug or an alternative drug that does not inhibit CYP2D6 [see *Drug Interactions* (7.1)].

Serotonin syndrome symptoms may include mental status changes (e.g., agitation, hallucinations, delirium, and coma), autonomic instability (e.g., tachycardia, labile blood pressure, dizziness, diaphoresis, flushing, hyperthermia), neuromuscular symptoms (e.g., tremor, rigidity, myoclonus, hyperreflexia, incoordination), seizures, and/or gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea).

Concomitant use of VYVANSE with MAOI drugs is contraindicated [see *Contraindications* (4)].

Discontinue treatment with VYVANSE and any concomitant serotonergic agents immediately if symptoms of serotonin syndrome occur, and initiate supportive symptomatic treatment. If concomitant use of VYVANSE with other serotonergic drugs or CYP2D6 inhibitors is clinically warranted, initiate VYVANSE with lower doses, monitor patients for the emergence of serotonin syndrome during drug initiation or titration, and inform patients of the increased risk for serotonin syndrome.

## 6 ADVERSE REACTIONS

The following adverse reactions are discussed in greater detail in other sections of the labeling:

- Known hypersensitivity to amphetamine products or other ingredients of VYVANSE [*see Contraindications (4)*]
- Hypertensive Crisis When Used Concomitantly with Monoamine Oxidase Inhibitors [*see Contraindications (4) and Drug Interactions (7.1)*]
- Drug Dependence [*see Boxed Warning, Warnings and Precautions (5.1), and Drug Abuse and Dependence (9.2, 9.3)*]
- Serious Cardiovascular Reactions [*see Warnings and Precautions (5.2)*]
- Blood Pressure and Heart Rate Increases [*see Warnings and Precautions (5.3)*]
- Psychiatric Adverse Reactions [*see Warnings and Precautions (5.4)*]
- Suppression of Growth [*see Warnings and Precautions (5.5)*]
- Peripheral Vasculopathy, including Raynaud's phenomenon [*see Warnings and Precautions (5.6)*]
- Serotonin Syndrome [*see Warnings and Precautions (5.7)*]

### 6.1 Clinical Trials Experience

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

#### Attention Deficit Hyperactivity Disorder

The safety data in this section is based on data from the 4-week controlled parallel-group clinical studies of VYVANSE in pediatric and adult patients with ADHD [*see Clinical Studies (14.1)*].

##### *Adverse Reactions Associated with Discontinuation of Treatment in ADHD Clinical Trials*

In the controlled trial in pediatric patients ages 6 to 12 years (Study 1), 8% (18/218) of VYVANSE-treated patients discontinued due to adverse reactions compared to 0% (0/72) of placebo-treated patients. The most frequently reported adverse reactions (1% or more and twice rate of placebo) were ECG voltage criteria for ventricular hypertrophy, tic, vomiting, psychomotor hyperactivity, insomnia, decreased appetite and rash [2 instances for each adverse reaction, i.e., 2/218 (1%)]. Less frequently reported adverse reactions (less than 1% or less than twice rate of placebo) included abdominal pain upper, dry mouth, weight decreased, dizziness, somnolence, logorrhea, chest pain, anger and hypertension.

In the controlled trial in pediatric patients ages 13 to 17 years (Study 4), 3% (7/233) of VYVANSE-treated patients discontinued due to adverse reactions compared to 1% (1/77) of placebo-treated patients. The most frequently reported adverse reactions (1% or more and twice rate of placebo) were decreased appetite (2/233; 1%) and insomnia (2/233; 1%). Less frequently reported adverse reactions (less than 1% or less than twice rate of placebo) included irritability, dermatillomania, mood swings, and dyspnea.



In the controlled adult trial (Study 7), 6% (21/358) of VYVANSE-treated patients discontinued due to adverse reactions compared to 2% (1/62) of placebo-treated patients. The most frequently reported adverse reactions (1% or more and twice rate of placebo) were insomnia (8/358; 2%), tachycardia (3/358; 1%), irritability (2/358; 1%), hypertension (4/358; 1%), headache (2/358; 1%), anxiety (2/358; 1%), and dyspnea (3/358; 1%). Less frequently reported adverse reactions (less than 1% or less than twice rate of placebo) included palpitations, diarrhea, nausea, decreased appetite, dizziness, agitation, depression, paranoia and restlessness.

*Adverse Reactions Occurring at an Incidence of  $\geq 5\%$  or More Among VYVANSE Treated Patients with ADHD in Clinical Trials*

The most common adverse reactions (incidence  $\geq 5\%$  and at a rate at least twice placebo) reported in pediatric patients ages 6 to 17 years, and/or adults were anorexia, anxiety, decreased appetite, decreased weight, diarrhea, dizziness, dry mouth, irritability, insomnia, nausea, upper abdominal pain, and vomiting.

*Adverse Reactions Occurring at an Incidence of 2% or More Among VYVANSE Treated Patients with ADHD in Clinical Trials*

Adverse reactions reported in the controlled trials in pediatric patients ages, 6 to 12 years (Study 1), pediatric patients ages 13 to 17 years (Study 4), and adult patients (Study 7) treated with VYVANSE or placebo are presented in Tables 1, 2 and 3 below.

**Table 1      Adverse Reactions Reported by 2% or More of Pediatric Patients Ages 6 to 12 Years with ADHD Taking VYVANSE and Greater than or Equal to Twice the Incidence in Patients Taking Placebo in a 4-Week Clinical Trial (Study 1)**

	VYVANSE (n=218)	Placebo (n=72)
Decreased Appetite	39%	4%
Insomnia	22%	3%
Abdominal Pain Upper	12%	6%
Irritability	10%	0%
Vomiting	9%	4%
Weight Decreased	9%	1%
Nausea	6%	3%
Dry Mouth	5%	0%
Dizziness	5%	0%
Affect lability	3%	0%
Rash	3%	0%
Pyrexia	2%	1%
Somnolence	2%	1%
Tic	2%	0%
Anorexia	2%	0%

**Table 2      Adverse Reactions Reported by 2% or More of Pediatric Patients Ages 13 to 17 Years with ADHD Taking VYVANSE and Greater than or Equal to Twice the Incidence in Patients Taking Placebo in a 4-Week Clinical Trial (Study 4)**

	VYVANSE (n=233)	Placebo (n=77)
Decreased Appetite	34%	3%
Insomnia	13%	4%
Weight Decreased	9%	0%
Dry Mouth	4%	1%
Palpitations	2%	1%
Anorexia	2%	0%
Tremor	2%	0%

**Table 3 Adverse Reactions Reported by 2% or More of Adult Patients with ADHD Taking VYVANSE and Greater than or Equal to Twice the Incidence in Patients Taking Placebo in a 4-Week Clinical Trial (Study 7)**

	VYVANSE (n=358)	Placebo (n=62)
Decreased Appetite	27%	2%
Insomnia	27%	8%
Dry Mouth	26%	3%
Diarrhea	7%	0%
Nausea	7%	0%
Anxiety	6%	0%
Anorexia	5%	0%
Feeling Jittery	4%	0%
Agitation	3%	0%
Increased Blood Pressure	3%	0%
Hyperhidrosis	3%	0%
Restlessness	3%	0%
Decreased Weight	3%	0%
Dyspnea	2%	0%
Increased Heart Rate	2%	0%
Tremor	2%	0%
Palpitations	2%	0%

In addition, in the adult population erectile dysfunction was observed in 2.6% of males on VYVANSE and 0% on placebo; decreased libido was observed in 1.4% of subjects on VYVANSE and 0% on placebo.

*Weight Loss and Slowing Growth Rate in Pediatric Patients with ADHD*

In a controlled trial of VYVANSE in pediatric patients ages 6 to 12 years (Study 1), mean weight loss from baseline after 4 weeks of therapy was -0.9, -1.9, and -2.5 pounds, respectively, for patients receiving 30 mg, 50 mg, and 70 mg of VYVANSE, compared to a 1 pound weight gain for patients receiving placebo. Higher doses were associated with greater weight loss with 4 weeks of treatment. Careful follow-up for weight in pediatric patients ages 6 to 12 years who received VYVANSE over 12 months suggests that consistently medicated pediatric patients (i.e., treatment for 7 days per week throughout the year) have a slowing in growth rate, measured by body weight as demonstrated by an age- and sex-normalized mean change from baseline in percentile, of -13.4 over 1 year (average percentiles at baseline and 12 months were 60.9 and 47.2, respectively). In a 4-week controlled trial of VYVANSE in pediatric patients ages 13 to 17 years, mean weight loss from baseline to endpoint was -2.7, -4.3, and -4.8 lbs., respectively, for patients receiving 30 mg, 50 mg, and 70 mg of VYVANSE, compared to a 2.0 pound weight gain for patients receiving placebo.

Careful follow-up of weight and height in pediatric patients ages 7 to 10 years who were randomized to either methylphenidate or non-medication treatment groups over 14 months, as well as in naturalistic subgroups of newly methylphenidate-treated and non-medication treated

pediatric patients over 36 months (to the ages of 10 to 13 years), suggests that consistently medicated pediatric patients ages 7 to 13 years (i.e., treatment for 7 days per week throughout the year) have a temporary slowing in growth rate (on average, a total of about 2 cm less growth in height and 2.7 kg less growth in weight over 3 years), without evidence of growth rebound during this period of development. In a controlled trial of amphetamine (d- to l-enantiomer ratio of 3:1) in pediatric patients ages 13 to 17 years, mean weight change from baseline within the initial 4 weeks of therapy was -1.1 pounds and -2.8 pounds, respectively, for patients receiving 10 mg and 20 mg of amphetamine. Higher doses were associated with greater weight loss within the initial 4 weeks of treatment [see *Warnings and Precautions* (5.5)].

#### *Weight Loss in Adults with ADHD*

In the controlled adult trial (Study 7), mean weight loss after 4 weeks of therapy was 2.8 pounds, 3.1 pounds, and 4.3 pounds, for patients receiving final doses of 30 mg, 50 mg, and 70 mg of VYVANSE, respectively, compared to a mean weight gain of 0.5 pounds for patients receiving placebo.

#### Binge Eating Disorder

The safety data in this section is based on data from two 12-week parallel group, flexible-dose, placebo-controlled studies in adults with BED [see *Clinical Studies* 14.2]. Patients with cardiovascular risk factors other than obesity and smoking were excluded.

#### *Adverse Reactions Associated with Discontinuation of Treatment in BED Clinical Trials*

In controlled trials of patients ages 18 to 55 years, 5.1% (19/373) of VYVANSE-treated patients discontinued due to adverse reactions compared to 2.4% (9/372) of placebo-treated patients. No single adverse reaction led to discontinuation in 1% or more of VYVANSE-treated patients. Less commonly reported adverse reactions (less than 1% or less than twice rate of placebo) included increased heart rate, headache, abdominal pain upper, dyspnea, rash, insomnia, irritability, feeling jittery and anxiety.

#### *Adverse Reactions Occurring at an Incidence of 5% or More and At Least Twice Placebo Among VYVANSE Treated Patients with BED in Clinical Trials*

The most common adverse reactions (incidence  $\geq 5\%$  and at a rate at least twice placebo) reported in adults were dry mouth, insomnia, decreased appetite, increased heart rate, constipation, feeling jittery, and anxiety.

#### *Adverse Reactions Occurring at an Incidence of 2% or More and At Least Twice Placebo Among VYVANSE Treated Patients with BED in Clinical Trials*

Adverse reactions reported in the pooled controlled trials in adult patients (Study 11 and 12) treated with VYVANSE or placebo are presented in Table 4 below.

**Table 4 Adverse Reactions Reported by 2% or More of Adult Patients with BED Taking VYVANSE and Greater than or Equal to Twice the Incidence in Patients Taking Placebo in 12-Week Clinical Trials (Study 11 and 12)**

	VYVANSE (N=373)	Placebo (N=372)
Dry Mouth	36%	7%
Insomnia <sup>1</sup>	20%	8%
Decreased Appetite	8%	2%
Increased Heart Rate <sup>2</sup>	7%	1%
Feeling Jittery	6%	1%
Constipation	6%	1%
Anxiety	5%	1%
Diarrhea	4%	2%
Decreased Weight	4%	0%
Hyperhidrosis	4%	0%
Vomiting	2%	1%
Gastroenteritis	2%	1%
Paresthesia	2%	1%
Pruritus	2%	1%
Upper Abdominal Pain	2%	0%
Energy Increased	2%	0%
Urinary Tract Infection	2%	0%
Nightmare	2%	0%
Restlessness	2%	0%
Oropharyngeal Pain	2%	0%

<sup>1</sup> Includes all preferred terms containing the word “insomnia.”

<sup>2</sup> Includes the preferred terms “heart rate increased” and “tachycardia.”

## 6.2 Postmarketing Experience

The following adverse reactions have been identified during postapproval use of VYVANSE. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure. These events are as follows: cardiomyopathy, mydriasis, diplopia, difficulties with visual accommodation, blurred vision, eosinophilic hepatitis, anaphylactic reaction, hypersensitivity, dyskinesia, dysgeusia, tics, bruxism, depression, dermatillomania, alopecia, aggression, Stevens-Johnson Syndrome, chest pain, angioedema, urticaria, seizures, libido changes, frequent or prolonged erections, constipation, rhabdomyolysis, and intestinal ischemia.

## 7 DRUG INTERACTIONS

### 7.1 Drugs Having Clinically Important Interactions with Amphetamines

**Table 5      Drugs having clinically important interactions with amphetamines.**

<b><i>MAO Inhibitors (MAOI)</i></b>	
Clinical Impact	MAOI antidepressants slow amphetamine metabolism, increasing amphetamines effect on the release of norepinephrine and other monoamines from adrenergic nerve endings causing headaches and other signs of hypertensive crisis. Toxic neurological effects and malignant hyperpyrexia can occur, sometimes with fatal results.
Intervention	Do not administer VYVANSE during or within 14 days following the administration of MAOI [see <i>Contraindications (4)</i> ].
<b><i>Serotonergic Drugs</i></b>	
Clinical Impact	The concomitant use of VYVANSE and serotonergic drugs increases the risk of serotonin syndrome.
Intervention	Initiate with lower doses and monitor patients for signs and symptoms of serotonin syndrome, particularly during VYVANSE initiation or dosage increase. If serotonin syndrome occurs, discontinue VYVANSE and the concomitant serotonergic drug(s) [see <i>Warnings and Precautions (5.7)</i> ].
<b><i>CYP2D6 Inhibitors</i></b>	
Clinical Impact	The concomitant use of VYVANSE and CYP2D6 inhibitors may increase the exposure of dextroamphetamine, the active metabolite of VYVANSE compared to the use of the drug alone and increase the risk of serotonin syndrome.
Intervention	Initiate with lower doses and monitor patients for signs and symptoms of serotonin syndrome particularly during VYVANSE initiation and after a dosage increase. If serotonin syndrome occurs, discontinue VYVANSE and the CYP2D6 inhibitor [see <i>Warnings and Precautions (5.7) and Overdosage (10)</i> ].
<b><i>Alkalinizing Agents</i></b>	
Clinical Impact	Urinary alkalinizing agents can increase blood levels and potentiate the action of amphetamine.
Intervention	Co-administration of VYVANSE and urinary alkalinizing agents should be avoided.
<b><i>Acidifying Agents</i></b>	
Clinical Impact	Urinary acidifying agents can lower blood levels and efficacy of amphetamines.
Intervention	Increase dose based on clinical response.
<b><i>Tricyclic Antidepressants</i></b>	
Clinical Impact	May enhance the activity of tricyclic or sympathomimetic agents causing striking and sustained increases in the concentration of d-amphetamine in the brain; cardiovascular effects can be potentiated.
Intervention	Monitor frequently and adjust or use alternative therapy based on clinical response.



## 7.2 Drugs Having No Clinically Important Interactions with VYVANSE

From a pharmacokinetic perspective, no dose adjustment of VYVANSE is necessary when VYVANSE is co-administered with guanfacine, venlafaxine, or omeprazole. In addition, no dose adjustment of guanfacine or venlafaxine is needed when VYVANSE is co-administered [*see Clinical Pharmacology (12.3)*].

From a pharmacokinetic perspective, no dose adjustment for drugs that are substrates of CYP1A2 (e.g., theophylline, duloxetine, melatonin), CYP2D6 (e.g., atomoxetine, desipramine, venlafaxine), CYP2C19 (e.g., omeprazole, lansoprazole, clobazam), and CYP3A4 (e.g., midazolam, pimozide, simvastatin) is necessary when VYVANSE is co-administered [*see Clinical Pharmacology (12.3)*].

## 8 USE IN SPECIFIC POPULATIONS

### 8.1 Pregnancy

#### Pregnancy Exposure Registry

There is a pregnancy exposure registry that monitors pregnancy outcomes in women exposed to ADHD medications during pregnancy. Healthcare providers are encouraged to register patients by calling the National Pregnancy Registry for Psychostimulants at 1-866-961-2388 or visiting online at <https://womensmentalhealth.org/clinical-and-researchprograms/pregnancyregistry/adhd-medications/>.

#### Risk Summary

The limited available data from published literature and postmarketing reports on use of VYVANSE in pregnant women are not sufficient to inform a drug-associated risk for major birth defects and miscarriage. Adverse pregnancy outcomes, including premature delivery and low birth weight, have been seen in infants born to mothers dependent on amphetamines [*see Clinical Considerations*]. In animal reproduction studies, lisdexamfetamine dimesylate (a prodrug of d-amphetamine) had no effects on embryo-fetal morphological development or survival when administered orally to pregnant rats and rabbits throughout the period of organogenesis. Pre- and postnatal studies were not conducted with lisdexamfetamine dimesylate. However, amphetamine (d- to l- ratio of 3:1) administration to pregnant rats during gestation and lactation caused a decrease in pup survival and a decrease in pup body weight that correlated with a delay in developmental landmarks at clinically relevant doses of amphetamine. In addition, adverse effects on reproductive performance were observed in pups whose mothers were treated with amphetamine. Long-term neurochemical and behavioral effects have also been reported in animal developmental studies using clinically relevant doses of amphetamine [*see Data*].

The estimated background risk of major birth defects and miscarriage for the indicated population is unknown. All pregnancies have a background risk of birth defect, loss or other adverse outcomes. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%, respectively.

## Clinical Considerations

### *Fetal/Neonatal Adverse Reactions*

Amphetamines, such as VYVANSE, cause vasoconstriction and thereby may decrease placental perfusion. In addition, amphetamines can stimulate uterine contractions increasing the risk of premature delivery. Infants born to amphetamine-dependent mothers have an increased risk of premature delivery and low birth weight.

Monitor infants born to mothers taking amphetamines for symptoms of withdrawal such as feeding difficulties, irritability, agitation, and excessive drowsiness.

## Data

### *Animal Data*

Lisdexamfetamine dimesylate had no apparent effects on embryo-fetal morphological development or survival when administered orally to pregnant rats and rabbits throughout the period of organogenesis at doses of up to 40 and 120 mg/kg/day, respectively. These doses are approximately 5.5 and 33 times, respectively, the maximum recommended human dose (MRHD) of 70 mg/day given to adults, on a mg/m<sup>2</sup> body surface area basis.

A study was conducted with amphetamine (d- to l- enantiomer ratio of 3:1) in which pregnant rats received daily oral doses of 2, 6, and 10 mg/kg from gestation day 6 to lactation day 20. All doses caused hyperactivity and decreased weight gain in the dams. A decrease in pup survival was seen at all doses. A decrease in pup body weight was seen at 6 and 10 mg/kg which correlated with delays in developmental landmarks, such as preputial separation and vaginal opening. Increased pup locomotor activity was seen at 10 mg/kg on day 22 postpartum but not at 5 weeks postweaning. When pups were tested for reproductive performance at maturation, gestational weight gain, number of implantations, and number of delivered pups were decreased in the group whose mothers had been given 10 mg/kg.

A number of studies from the literature in rodents indicate that prenatal or early postnatal exposure to amphetamine (d- or d, l-) at doses similar to those used clinically can result in long-term neurochemical and behavioral alterations. Reported behavioral effects include learning and memory deficits, altered locomotor activity, and changes in sexual function.

## **8.2 Lactation**

### Risk Summary

Lisdexamfetamine is a pro-drug of dextroamphetamine. Based on limited case reports in published literature, amphetamine (d-or d, l-) is present in human milk, at relative infant doses of 2% to 13.8% of the maternal weight-adjusted dosage and a milk/plasma ratio ranging between 1.9 and 7.5. There are no reports of adverse effects on the breastfed infant. Long-term neurodevelopmental effects on infants from amphetamine exposure are unknown. It is possible that large dosages of dextroamphetamine might interfere with milk production, especially in women whose lactation is not well established. Because of the potential for serious adverse reactions in nursing infants, including serious cardiovascular reactions, blood pressure and heart rate increase, suppression of growth, and peripheral vasculopathy, advise patients that breastfeeding is not recommended during treatment with VYVANSE.

## 8.4 Pediatric Use

### ADHD

Safety and effectiveness of VYVANSE have been established in pediatric patients with ADHD ages 6 to 17 years [*see Dosage and Administration (2.3), Adverse Reactions (6.1), Clinical Pharmacology (12.3), and Clinical Studies (14.1)*].

Safety and effectiveness of VYVANSE have not been established in pediatric patients below the age of 6 years.

Safety and efficacy of VYVANSE were evaluated in a double-blind, randomized, parallel-group, placebo-controlled, fixed-dose study in pediatric patients ages 4 to 5 years with ADHD, followed by a 1-year open-label extension study. In these studies, patients experienced elevated rates of adverse reactions, including weight loss, decreased BMI, decreased appetite, insomnia, infections (upper respiratory and nasopharyngitis), irritability, and affect lability.

With the same VYVANSE dose, mean steady state exposure of dextroamphetamine was approximately 44% higher in pediatric patients ages 4 to 5 years compared to the pediatric patients ages 6 to 11 years.

### BED

Safety and effectiveness of VYVANSE have not been established in patients less than 18 years of age.

### Growth Suppression

Growth should be monitored during treatment with stimulants, including VYVANSE, and pediatric patients who are not growing or gaining weight as expected may need to have their treatment interrupted [*see Warnings and Precautions (5.5) and Adverse Reactions (6.1)*].

### Juvenile Animal Data

Studies conducted in juvenile rats and dogs at clinically relevant doses showed growth suppression that partially or fully reversed in dogs and female rats but not in male rats after a four-week drug-free recovery period.

A study was conducted in which juvenile rats received oral doses of 4, 10, or 40 mg/kg/day of lisdexamfetamine dimesylate from day 7 to day 63 of age. These doses are approximately 0.3, 0.7, and 3 times the maximum recommended human daily dose of 70 mg on a mg/m<sup>2</sup> basis for a child. Dose-related decreases in food consumption, bodyweight gain, and crown-rump length were seen; after a four-week drug-free recovery period, bodyweights and crown-rump lengths had significantly recovered in females but were still substantially reduced in males. Time to vaginal opening was delayed in females at the highest dose, but there were no drug effects on fertility when the animals were mated beginning on day 85 of age.

In a study in which juvenile dogs received lisdexamfetamine dimesylate for 6 months beginning at 10 weeks of age, decreased bodyweight gain was seen at all doses tested (2, 5, and 12 mg/kg/day, which are approximately 0.5, 1, and 3 times the maximum recommended human

daily dose on a mg/m<sup>2</sup> basis for a child). This effect partially or fully reversed during a four-week drug-free recovery period.

## 8.5 Geriatric Use

Clinical studies of VYVANSE did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience and pharmacokinetic data [see *Clinical Pharmacology (12.3)*] have not identified differences in responses between the elderly and younger patients. In general, dose selection for an elderly patient should start at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy.

## 8.6 Renal Impairment

Due to reduced clearance in patients with severe renal impairment (GFR 15 to < 30 mL/min/1.73 m<sup>2</sup>), the maximum dose should not exceed 50 mg/day. The maximum recommended dose in ESRD (GFR < 15 mL/min/1.73 m<sup>2</sup>) patients is 30 mg/day [see *Clinical Pharmacology (12.3)*].

Lisdexamfetamine and d-amphetamine are not dialyzable.

# 9 DRUG ABUSE AND DEPENDENCE

## 9.1 Controlled Substance

VYVANSE contains lisdexamfetamine, a prodrug of amphetamine, a Schedule II controlled substance.

## 9.2 Abuse

CNS stimulants, including VYVANSE, other amphetamine-containing products, and methylphenidate have a high potential for abuse. Abuse is the intentional non-therapeutic use of a drug, even once, to achieve a desired psychological or physiological effect. Abuse is characterized by impaired control over drug use, compulsive use, continued use despite harm, and craving. Drug addiction is a cluster of behavioral, cognitive, and physiological phenomena that may include a strong desire to take the drug, difficulties in controlling drug use (e.g., continuing drug use despite harmful consequences, giving higher priority to drug use than other activities and obligations), and possible tolerance or physical dependence. Both abuse and misuse may lead to addiction, and some individuals may develop addiction even when taking VYVANSE as prescribed.

Signs and symptoms of amphetamine abuse may include increased heart rate, respiratory rate, blood pressure, and/or sweating, dilated pupils, hyperactivity, restlessness, insomnia, decreased appetite, loss of coordination, tremors, flushed skin, vomiting, and/or abdominal pain. Anxiety, psychosis, hostility, aggression, suicidal or homicidal ideation have also been seen. Abusers of

CNS stimulants may chew, snort, inject, or use other unapproved routes of administration which can result in overdose and death [see *Overdosage (10)*].

To reduce the abuse of CNS stimulants, including VYVANSE, assess the risk of abuse prior to prescribing. After prescribing, keep careful prescription records, educate patients and their families about abuse and on proper storage and disposal of CNS stimulants. Monitor for signs of abuse while on therapy, and re-evaluate the need for VYVANSE use.

#### Studies of VYVANSE in Drug Abusers

A randomized, double-blind, placebo-control, cross-over, abuse liability study in 38 patients with a history of drug abuse was conducted with single-doses of 50, 100, or 150 mg of VYVANSE, 40 mg of immediate-release d-amphetamine sulphate (a controlled II substance), and 200 mg of diethylpropion hydrochloride (a controlled IV substance). VYVANSE 100 mg produced significantly less "Drug Liking Effects" as measured by the Drug Rating Questionnaire-Subject score, compared to d-amphetamine 40 mg; and 150 mg of VYVANSE demonstrated similar "Drug-Liking Effects" compared to 40 mg of d-amphetamine and 200 mg of diethylpropion.

Intravenous administration of 50 mg lisdexamfetamine dimesylate to individuals with a history of drug abuse produced positive subjective responses on scales measuring "Drug Liking", "Euphoria", "Amphetamine Effects", and "Benzedrine Effects" that were greater than placebo but less than those produced by an equivalent dose (20 mg) of intravenous d-amphetamine.

### **9.3 Dependence**

#### Physical Dependence

VYVANSE may produce physical dependence from continued therapy. Physical dependence is a state of adaptation manifested by a withdrawal syndrome produced by abrupt cessation, rapid dose reduction, or administration of an antagonist. Withdrawal symptoms after abrupt cessation following prolonged high-dosage administration of CNS stimulants include extreme fatigue and depression.

#### Tolerance

VYVANSE may produce tolerance from continued therapy. Tolerance is a state of adaptation in which exposure to a specific dose of a drug results in a reduction of the drug's desired and/or undesired effects over time.

## **10 OVERDOSAGE**

Consult with a Certified Poison Control Center (1-800-222-1222) for up-to-date guidance and advice for treatment of overdose. Individual patient response to amphetamines varies widely. Toxic symptoms may occur idiosyncratically at low doses.

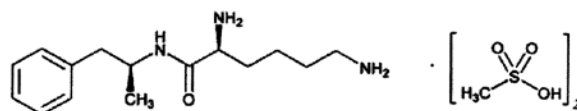
Manifestations of amphetamine overdose include restlessness, tremor, hyperreflexia, rapid respiration, confusion, assaultiveness, hallucinations, panic states, hyperpyrexia and rhabdomyolysis. Fatigue and depression usually follow the central nervous system stimulation. Serotonin syndrome has been reported with amphetamine use, including VYVANSE. Cardiovascular effects include arrhythmias, hypertension or hypotension and circulatory

collapse. Gastrointestinal symptoms include nausea, vomiting, diarrhea and abdominal cramps. Fatal poisoning is usually preceded by convulsions and coma.

Lisdexamfetamine and d-amphetamine are not dialyzable.

## 11 DESCRIPTION

VYVANSE (lisdexamfetamine dimesylate), a CNS stimulant, is for once-a-day oral administration. The chemical designation for lisdexamfetamine dimesylate is (2S)-2,6-diamino-N-[(1S)-1-methyl-2-phenylethyl] hexanamide dimethanesulfonate. The molecular formula is  $C_{15}H_{25}N_3O \cdot (CH_4O_3S)_2$ , which corresponds to a molecular weight of 455.60. The chemical structure is:



Lisdexamfetamine dimesylate is a white to off-white powder that is soluble in water (792 mg/mL).

### *Information for VYVANSE capsules:*

VYVANSE capsules contain 10 mg, 20 mg, 30 mg, 40 mg, 50 mg, 60 mg, and 70 mg of lisdexamfetamine dimesylate (equivalent to 5.8 mg, 11.6 mg, 17.3 mg, 23.1 mg, 28.9 mg, 34.7 mg, and 40.5 mg of lisdexamfetamine).

Inactive ingredients: microcrystalline cellulose, croscarmellose sodium, and magnesium stearate. The capsule shells contain gelatin, titanium dioxide, and one or more of the following: FD&C Red #3, FD&C Yellow #6, FD&C Blue #1, Black Iron Oxide, and Yellow Iron Oxide.

### *Information for VYVANSE chewable tablets:*

VYVANSE chewable tablets contain 10 mg, 20 mg, 30 mg, 40 mg, 50 mg, and 60 mg of lisdexamfetamine dimesylate (equivalent to 5.8 mg, 11.6 mg, 17.3 mg, 23.1 mg, 28.9 mg, and 34.7 mg of lisdexamfetamine).

Inactive ingredients: colloidal silicon dioxide, croscarmellose sodium, guar gum, magnesium stearate, mannitol, microcrystalline cellulose, sucralose, artificial strawberry flavor.

## 12 CLINICAL PHARMACOLOGY

### 12.1 Mechanism of Action

Lisdexamfetamine is a prodrug of dextroamphetamine. Amphetamines are non-catecholamine sympathomimetic amines with CNS stimulant activity. The exact mode of therapeutic action in ADHD and BED is not known.



## 12.2 Pharmacodynamics

Amphetamines block the reuptake of norepinephrine and dopamine into the presynaptic neuron and increase the release of these monoamines into the extraneuronal space. The parent drug, lisdexamfetamine, does not bind to the sites responsible for the reuptake of norepinephrine and dopamine *in vitro*.

## 12.3 Pharmacokinetics

Pharmacokinetic studies after oral administration of lisdexamfetamine dimesylate have been conducted in healthy adult (capsule and chewable tablet formulations) and pediatric (6 to 12 years) patients with ADHD (capsule formulation). After single dose administration of lisdexamfetamine dimesylate, pharmacokinetics of dextroamphetamine was found to be linear between 30 mg and 70 mg in a pediatric study (6 to 12 years), and between 50 mg and 250 mg in an adult study. Dextroamphetamine pharmacokinetic parameters following administration of lisdexamfetamine dimesylate in adults exhibited low inter-subject (<25%) and intra-subject (<8%) variability. There is no accumulation of lisdexamfetamine and dextroamphetamine at steady state in healthy adults.

### Absorption

#### *Capsule formulation*

Following single-dose oral administration of VYVANSE capsule (30 mg, 50 mg, or 70 mg) in patients ages 6 to 12 years with ADHD under fasted conditions,  $T_{max}$  of lisdexamfetamine and dextroamphetamine was reached at approximately 1 hour and 3.5 hours post dose, respectively. Weight/Dose normalized AUC and  $C_{max}$  values were the same in pediatric patients ages 6 to 12 years as the adults following single doses of 30 mg to 70 mg VYVANSE capsule.

#### *Effect of food on capsule formulation*

Neither food (a high fat meal or yogurt) nor orange juice affects the observed AUC and  $C_{max}$  of dextroamphetamine in healthy adults after single-dose oral administration of 70 mg of VYVANSE capsules. Food prolongs  $T_{max}$  by approximately 1 hour (from 3.8 hours at fasted state to 4.7 hours after a high fat meal or to 4.2 hours with yogurt). After an 8-hour fast, the AUC for dextroamphetamine following oral administration of lisdexamfetamine dimesylate in solution and as intact capsules were equivalent.

#### *Chewable Tablet formulation*

After a single dose administration of 60 mg VYVANSE chewable tablet in healthy subjects under fasted conditions,  $T_{max}$  of lisdexamfetamine and dextroamphetamine was reached at approximately 1 hour and 4.4 hours post dose, respectively. Compared to 60 mg VYVANSE capsule, exposure ( $C_{max}$  and AUC) to lisdexamfetamine was about 15% lower. The exposure ( $C_{max}$  and  $AUC_{inf}$ ) of dextroamphetamine is similar between VYVANSE chewable tablet and VYVANSE capsule.

#### *Effect of food on tablet formulation*

Administration of 60 mg VYVANSE chewable tablet with food (a high-fat meal) decreases the exposure ( $C_{\max}$  and  $AUC_{\text{inf}}$ ) of dextroamphetamine by about 5% to 7%, and prolongs mean  $T_{\max}$  by approximately 1 hour (from 3.9 hours at fasted state to 4.9 hours).

#### Elimination

Plasma concentrations of unconverted lisdexamfetamine are low and transient, generally becoming non-quantifiable by 8 hours after administration. The plasma elimination half-life of lisdexamfetamine typically averaged less than one hour in volunteers ages 6 years and older. The plasma elimination half-life of dextroamphetamine was approximately 8.6 to 9.5 hours in pediatric patients 6 to 12 years and 10 to 11.3 hours in healthy adults.

#### *Metabolism*

Lisdexamfetamine is converted to dextroamphetamine and l-lysine primarily in blood due to the hydrolytic activity of red blood cells after oral administration of lisdexamfetamine dimesylate. *In vitro* data demonstrated that red blood cells have a high capacity for metabolism of lisdexamfetamine; substantial hydrolysis occurred even at low hematocrit levels (33% of normal). Lisdexamfetamine is not metabolized by cytochrome P450 enzymes.

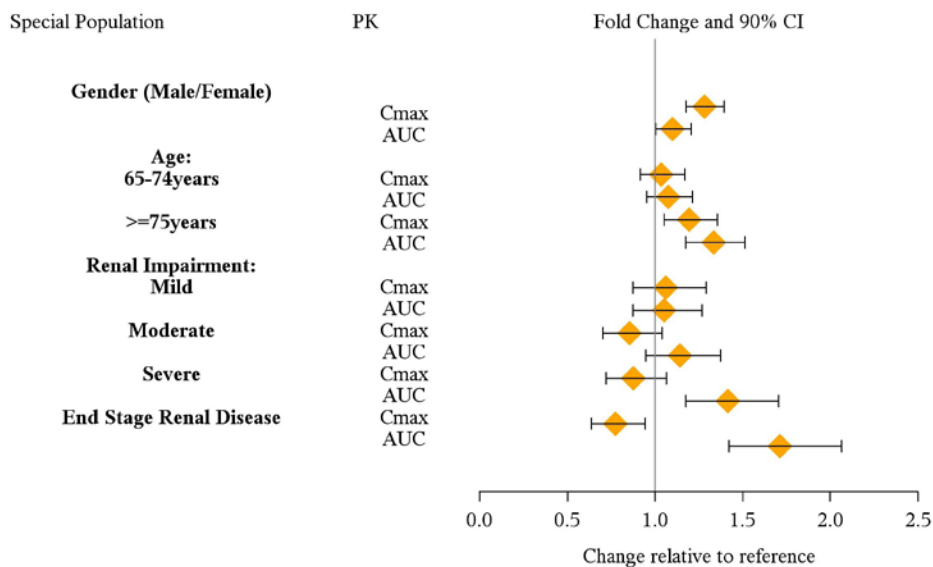
#### *Excretion*

Following oral administration of a 70 mg dose of radiolabeled lisdexamfetamine dimesylate to 6 healthy subjects, approximately 96% of the oral dose radioactivity was recovered in the urine and only 0.3% recovered in the feces over a period of 120 hours. Of the radioactivity recovered in the urine, 42% of the dose was related to amphetamine, 25% to hippuric acid, and 2% to intact lisdexamfetamine.

#### Specific Populations

Exposures of dextroamphetamine in specific populations are summarized in Figure 1.

**Figure 1: Specific Populations\*:**

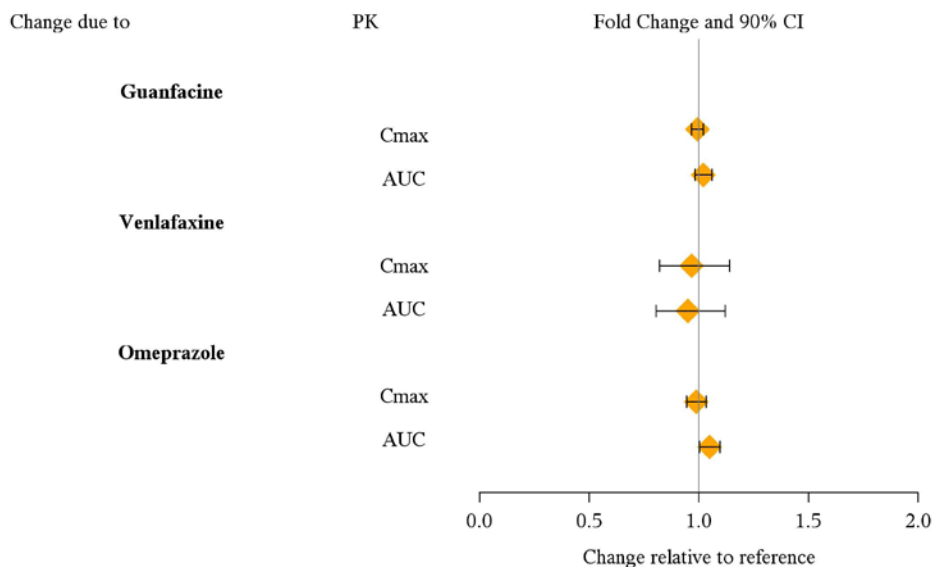


\*Figure 1 shows the geometric mean ratios and the 90% confidence limits for C<sub>max</sub> and AUC of d-amphetamine. Comparison for gender uses males as the reference. Comparison for age uses 55-64 years as the reference.

### Drug Interaction Studies

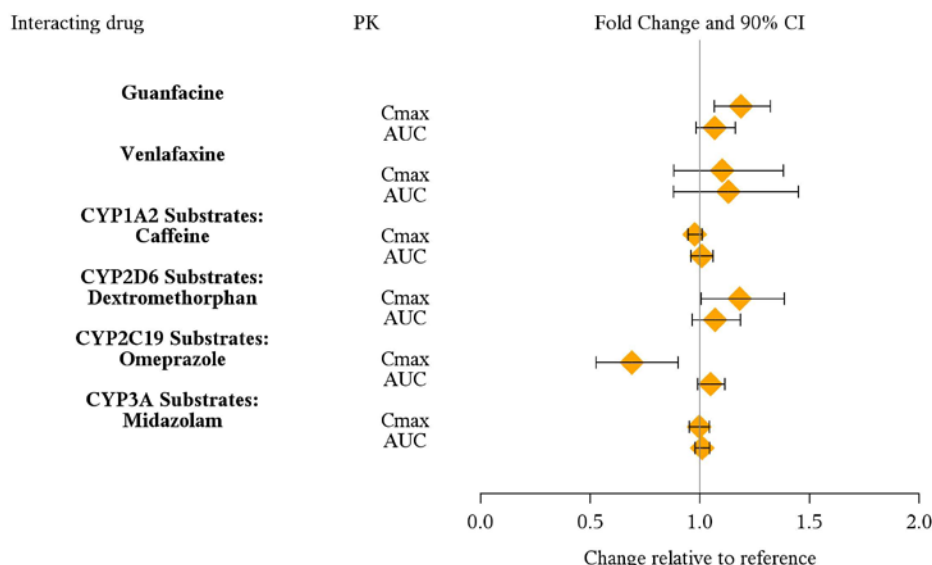
Effects of other drugs on the exposures of dextroamphetamine are summarized in Figure 2.

**Figure 2: Effect of Other Drugs on VYVANSE:**



The effects of VYVANSE on the exposures of other drugs are summarized in Figure 3.

**Figure 3: Effect of VYVANSE on Other Drugs:**



## 13 NONCLINICAL TOXICOLOGY

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

#### Carcinogenesis

Carcinogenicity studies of lisdexamfetamine dimesylate have not been performed. No evidence of carcinogenicity was found in studies in which d-, l-amphetamine (enantiomer ratio of 1:1) was administered to mice and rats in the diet for 2 years at doses of up to 30 mg/kg/day in male mice, 19 mg/kg/day in female mice, and 5 mg/kg/day in male and female rats.

#### Mutagenesis

Lisdexamfetamine dimesylate was not clastogenic in the mouse bone marrow micronucleus test *in vivo* and was negative when tested in the *E. coli* and *S. typhimurium* components of the Ames test and in the L5178Y/TK<sup>+/−</sup> mouse lymphoma assay *in vitro*.

#### Impairment of Fertility

Amphetamine (d- to l-enantiomer ratio of 3:1) did not adversely affect fertility or early embryonic development in the rat at doses of up to 20 mg/kg/day.

### 13.2 Animal Toxicology and/or Pharmacology

Acute administration of high doses of amphetamine (d- or d, l-) has been shown to produce long-lasting neurotoxic effects, including irreversible nerve fiber damage, in rodents. The significance of these findings to humans is unknown.

## 14 CLINICAL STUDIES

### 14.1 Attention Deficit Hyperactivity Disorder (ADHD)

#### Pediatric Patients Ages 6 to 12 Years with ADHD

A double-blind, randomized, placebo-controlled, parallel-group study (Study 1) was conducted in pediatric patients ages 6 to 12 years (N=290) who met DSM-IV criteria for ADHD (either the combined type or the hyperactive-impulsive type). Patients were randomized to receive final doses of 30 mg, 50 mg, or 70 mg of VYVANSE or placebo once daily in the morning for a total of four weeks of treatment. All patients receiving VYVANSE were initiated on 30 mg for the first week of treatment. Patients assigned to the 50 mg and 70 mg dose groups were titrated by 20 mg per week until they achieved their assigned dose. The primary efficacy outcome was change in Total Score from baseline to endpoint in investigator ratings on the ADHD Rating Scale (ADHD-RS), an 18-item questionnaire with a score range of 0-54 points that measures the core symptoms of ADHD which includes both hyperactive/impulsive and inattentive subscales. Endpoint was defined as the last post-randomization treatment week (i.e., Weeks 1 through 4) for which a valid score was obtained. All VYVANSE dose groups were superior to placebo in the primary efficacy outcome. Mean effects at all doses were similar; however, the highest dose (70 mg/day) was numerically superior to both lower doses (Study 1 in Table 6). The effects were maintained throughout the day based on parent ratings (Conners' Parent Rating Scale) in the morning (approximately 10 am), afternoon (approximately 2 pm), and early evening (approximately 6 pm).

A double-blind, placebo-controlled, randomized, crossover design, analog classroom study (Study 2) was conducted in pediatric patients ages 6 to 12 years (N=52) who met DSM-IV criteria for ADHD (either the combined type or the hyperactive-impulsive type). Following a 3-week open-label dose optimization with Adderall XR<sup>®</sup>, patients were randomly assigned to continue their optimized dose of Adderall XR (10 mg, 20 mg, or 30 mg), VYVANSE (30 mg, 50 mg, or 70 mg), or placebo once daily in the morning for 1 week each treatment. Efficacy assessments were conducted at 1, 2, 3, 4.5, 6, 8, 10, and 12 hours post-dose using the Swanson, Kotkin, Agler, M.Flynn, and Pelham Department scores (SKAMP-DS), a 4-item subscale of the SKAMP with scores ranging from 0 to 24 points that measures department problems leading to classroom disruptions. A significant difference in patient behavior, based upon the average of investigator ratings on the SKAMP-DS across the 8 assessments were observed between patients when they received VYVANSE compared to patients when they received placebo (Study 2 in Table 6). The drug effect reached statistical significance from hours 2 to 12 post-dose, but was not significant at 1 hour.

A second double-blind, placebo-controlled, randomized, crossover design, analog classroom study (Study 3) was conducted in pediatric patients ages 6 to 12 years (N=129) who met DSM-IV criteria for ADHD (either the combined type or the hyperactive-impulsive type). Following a 4-week open-label dose optimization with VYVANSE (30 mg, 50 mg, 70 mg), patients were randomly assigned to continue their optimized dose of VYVANSE or placebo once daily in the morning for 1 week each treatment. A significant difference in patient behavior, based upon the average of investigator ratings on the SKAMP-Department scores across all 7 assessments conducted at 1.5, 2.5, 5.0, 7.5, 10.0, 12.0, and 13.0 hours post-dose, were observed between

patients when they received VYVANSE compared to patients when they received placebo (Study 3 in Table 6, Figure 4).

#### Pediatric Patients Ages 13 to 17 Years with ADHD

A double-blind, randomized, placebo-controlled, parallel-group study (Study 4) was conducted in pediatric patients ages 13 to 17 years (N=314) who met DSM-IV criteria for ADHD. In this study, patients were randomized in a 1:1:1:1 ratio to a daily morning dose of VYVANSE (30 mg/day, 50 mg/day or 70 mg/day) or placebo for a total of four weeks of treatment. All patients receiving VYVANSE were initiated on 30 mg for the first week of treatment. Patients assigned to the 50 mg and 70 mg dose groups were titrated by 20 mg per week until they achieved their assigned dose. The primary efficacy outcome was change in Total Score from baseline to endpoint in investigator ratings on the ADHD Rating Scale (ADHD-RS). Endpoint was defined as the last post-randomization treatment week (i.e., Weeks 1 through 4) for which a valid score was obtained. All VYVANSE dose groups were superior to placebo in the primary efficacy outcome (Study 4 in Table 6).

#### Pediatric Patients Ages 6 to 17 Years: Short-Term Treatment in ADHD

A double-blind, randomized, placebo- and active-controlled parallel-group, dose-optimization study (Study 5) was conducted in pediatric patients ages 6 to 17 years (n=336) who met DSM-IV criteria for ADHD. In this eight-week study, patients were randomized to a daily morning dose of VYVANSE (30, 50 or 70 mg/day), an active control, or placebo (1:1:1). The study consisted of a Screening and Washout Period (up to 42 days), a 7-week Double-blind Evaluation Period (consisting of a 4-week Dose-Optimization Period followed by a 3-week Dose-Maintenance Period), and a 1-week Washout and Follow-up Period. During the Dose Optimization Period, subjects were titrated until an optimal dose, based on tolerability and investigator's judgment, was reached. VYVANSE showed significantly greater efficacy than placebo. The placebo-adjusted mean reduction from baseline in the ADHD-RS-IV total score was 18.6. Subjects on VYVANSE also showed greater improvement on the Clinical Global Impression-Improvement (CGI-I) rating scale compared to subjects on placebo (Study 5 in Table 6).

#### Pediatric Patients Ages 6 to 17 Years: Maintenance Treatment in ADHD

Maintenance of Efficacy Study (Study 6) - A double-blind, placebo-controlled, randomized withdrawal study was conducted in pediatric patients ages 6 to 17 years (N=276) who met the diagnosis of ADHD (DSM-IV criteria). A total of 276 patients were enrolled into the study, 236 patients participated in Study 5 and 40 subjects directly enrolled. Subjects were treated with open-label VYVANSE for at least 26 weeks prior to being assessed for entry into the randomized withdrawal period. Eligible patients had to demonstrate treatment response as defined by CGI-S <3 and Total Score on the ADHD-RS  $\leq 22$ . Patients that maintained treatment response for 2 weeks at the end of the open label treatment period were eligible to be randomized to ongoing treatment with the same dose of VYVANSE (N=78) or switched to placebo (N=79) during the double-blind phase. Patients were observed for relapse (treatment failure) during the 6 week double blind phase. A significantly lower proportion of treatment failures occurred among VYVANSE subjects (15.8%) compared to placebo (67.5%) at endpoint of the randomized withdrawal period. The endpoint measurement was defined as the last post-randomization treatment week at which a valid ADHD-RS Total Score and CGI-S were observed. Treatment failure was defined as a  $\geq 50\%$  increase (worsening) in the ADHD-RS Total



Score and a  $\geq 2$ -point increase in the CGI-S score compared to scores at entry into the double-blind randomized withdrawal phase. Subjects who withdrew from the randomized withdrawal period and who did not provide efficacy data at their last on-treatment visit were classified as treatment failures (Study 6, Figure 5).

#### Adults: Short-Term Treatment in ADHD

A double-blind, randomized, placebo-controlled, parallel-group study (Study 7) was conducted in adults ages 18 to 55 (N=420) who met DSM-IV criteria for ADHD. In this study, patients were randomized to receive final doses of 30 mg, 50 mg, or 70 mg of VYVANSE or placebo for a total of four weeks of treatment. All patients receiving VYVANSE were initiated on 30 mg for the first week of treatment. Patients assigned to the 50 mg and 70 mg dose groups were titrated by 20 mg per week until they achieved their assigned dose. The primary efficacy outcome was change in Total Score from baseline to endpoint in investigator ratings on the ADHD Rating Scale (ADHD-RS). Endpoint was defined as the last post-randomization treatment week (i.e., Weeks 1 through 4) for which a valid score was obtained. All VYVANSE dose groups were superior to placebo in the primary efficacy outcome (Study 7 in Table 6).

The second study was a multi-center, randomized, double-blind, placebo-controlled, cross-over, modified analog classroom study (Study 8) of VYVANSE to simulate a workplace environment in 142 adults ages 18 to 55 who met DSM-IV-TR criteria for ADHD. There was a 4-week open-label, dose optimization phase with VYVANSE (30 mg/day, 50 mg/day, or 70 mg/day in the morning). Patients were then randomized to one of two treatment sequences: 1) VYVANSE (optimized dose) followed by placebo, each for one week, or 2) placebo followed by VYVANSE, each for one week. Efficacy assessments occurred at the end of each week, using the Permanent Product Measure of Performance (PERMP), a skill-adjusted math test that measures attention in ADHD. PERMP total score results from the sum of the number of math problems attempted plus the number of math problems answered correctly. VYVANSE treatment, compared to placebo, resulted in a statistically significant improvement in attention across all post-dose time points, as measured by average PERMP total scores over the course of one assessment day, as well as at each time point measured. The PERMP assessments were administered at pre-dose (-0.5 hours) and at 2, 4, 8, 10, 12, and 14 hours post-dose (Study 8 in Table 6, Figure 6).

#### Adults: Maintenance Treatment in ADHD

A double-blind, placebo-controlled, randomized withdrawal design study (Study 9) was conducted in adults ages 18 to 55 (N=123) who had a documented diagnosis of ADHD or met DSM-IV criteria for ADHD. At study entry, patients must have had documentation of treatment with VYVANSE for a minimum of 6 months and had to demonstrate treatment response as defined by Clinical Global Impression Severity (CGI-S)  $\leq 3$  and Total Score on the ADHD-RS  $< 22$ . ADHD-RS Total Score is a measure of core symptoms of ADHD. The CGI-S score assesses the clinician's impression of the patient's current illness state and ranges from 1 (not at all ill) to 7 (extremely ill). Patients that maintained treatment response at Week 3 of the open label treatment phase (N=116) were eligible to be randomized to ongoing treatment with the same dose of VYVANSE (N=56) or switched to placebo (N=60) during the double-blind phase. Patients were observed for relapse (treatment failure) during the 6-week double-blind phase. The efficacy endpoint was the proportion of patients with treatment failure during the double-blind

phase. Treatment failure was defined as a  $\geq 50\%$  increase (worsening) in the ADHD-RS Total Score and  $\geq 2$ -point increase in the CGI-S score compared to scores at entry into the double-blind phase. Maintenance of efficacy for patients treated with VYVANSE was demonstrated by the significantly lower proportion of patients with treatment failure (9%) compared to patients receiving placebo (75%) at endpoint during the double-blind phase (Study 9, Figure 7).

**Table 6: Summary of Primary Efficacy Results from Short-term Studies of VYVANSE in Pediatric Patients (Ages 6 to 17) and Adults with ADHD**

Study Number (Age range)	Primary Endpoint	Treatment Group	Mean Baseline Score (SD)	LS Mean Change from Baseline (SE)	Placebo-subtracted Difference <sup>a</sup> (95% CI)
Study 1 (6 - 12 years)	ADHD-RS-IV	VYVANSE (30 mg/day)*	43.2 (6.7)	-21.8 (1.6)	-15.6 (-19.9, -11.2)
		VYVANSE (50 mg/day)*	43.3 (6.7)	-23.4 (1.6)	-17.2 (-21.5, -12.9)
		VYVANSE (70 mg/day)*	45.1(6.8)	-26.7 (1.5)	-20.5 (-24.8, -16.2)
		Placebo	42.4 (7.1)	-6.2 (1.6)	--
Study 2 (6 - 12 years)	Average SKAMP-DS	VYVANSE (30, 50 or 70 mg/day)*	-- <sup>b</sup>	0.8 (0.1) <sup>d</sup>	-0.9 (-1.1, -0.7)
		Placebo	-- <sup>b</sup>	1.7 (0.1) <sup>d</sup>	--
Study 3 (6 - 12 years)	Average SKAMP-DS	VYVANSE (30, 50 or 70 mg/day)*	0.9 (1.0) <sup>c</sup>	0.7 (0.1) <sup>d</sup>	-0.7 (-0.9, -0.6)
		Placebo	0.7 (0.9) <sup>c</sup>	1.4 (0.1) <sup>d</sup>	--
Study 4 (13 - 17 years)	ADHD-RS-IV	VYVANSE (30 mg/day)*	38.3 (6.7)	-18.3 (1.2)	-5.5 (-9.0, -2.0)
		VYVANSE (50 mg/day)*	37.3 (6.3)	-21.1 (1.3)	-8.3 (-11.8, -4.8)
		VYVANSE (70 mg/day)*	37.0 (7.3)	-20.7 (1.3)	-7.9 (-11.4, -4.5)
		Placebo	38.5 (7.1)	-12.8 (1.2)	--
Study 5 (6 - 17 years)	ADHD-RS-IV	VYVANSE (30, 50 or 70 mg/day)*	40.7 (7.3)	-24.3 (1.2)	-18.6 (-21.5, -15.7)
		Placebo	41.0 (7.1)	-5.7 (1.1)	--
Study 7 (18 - 55 years)	ADHD-RS-IV	VYVANSE (30 mg/day)*	40.5 (6.2)	-16.2 (1.1)	-8.0 (-11.5, -4.6)
		VYVANSE (50 mg/day)*	40.8 (7.3)	-17.4 (1.0)	-9.2 (-12.6, -5.7)
		VYVANSE (70 mg/day)*	41.0 (6.0)	-18.6 (1.0)	-10.4 (-13.9, -6.9)
		Placebo	39.4 (6.4)	-8.2 (1.4)	--
Study 8 (18 - 55 years)	Average PERMP	VYVANSE (30, 50 or 70 mg/day)*	260.1 (86.2) <sup>c</sup>	312.9 (8.6) <sup>d</sup>	23.4 (15.6, 31.2)
		Placebo	261.4 (75.0) <sup>c</sup>	289.5 (8.6) <sup>d</sup>	--

SD: standard deviation; SE: standard error; LS Mean: least-squares mean; CI: confidence interval.

<sup>a</sup> Difference (drug minus placebo) in least-squares mean change from baseline.

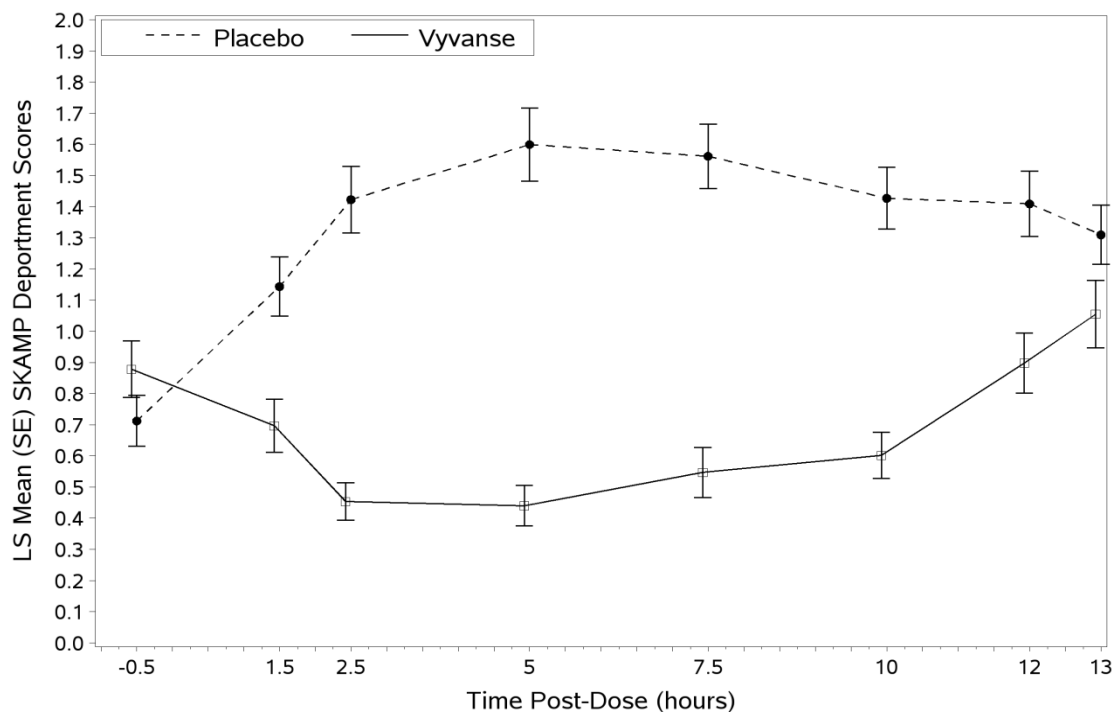
<sup>b</sup> Pre-dose SKAMP-DS was not collected.

<sup>c</sup> Pre-dose SKAMP-DS (Study 3) or PERMP (Study 8) total score, averaged over both periods.

<sup>d</sup> LS Mean for SKAMP-DS (Study 2 and 3) or PERMP (Study 8) is post-dose average score over all sessions of the treatment day, rather than change from baseline.

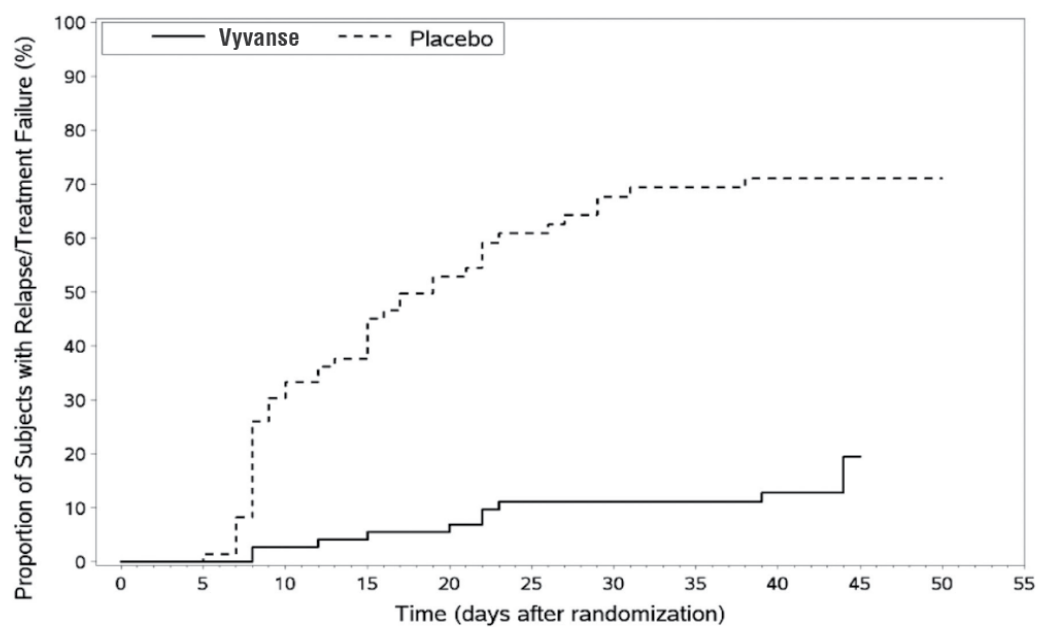
\* Doses statistically significantly superior to placebo.

**Figure 4** LS Mean SKAMP Department Subscale Score by Treatment and Time-point for Pediatric Patients Ages 6 to 12 with ADHD after 1 Week of Double Blind Treatment (Study 3)

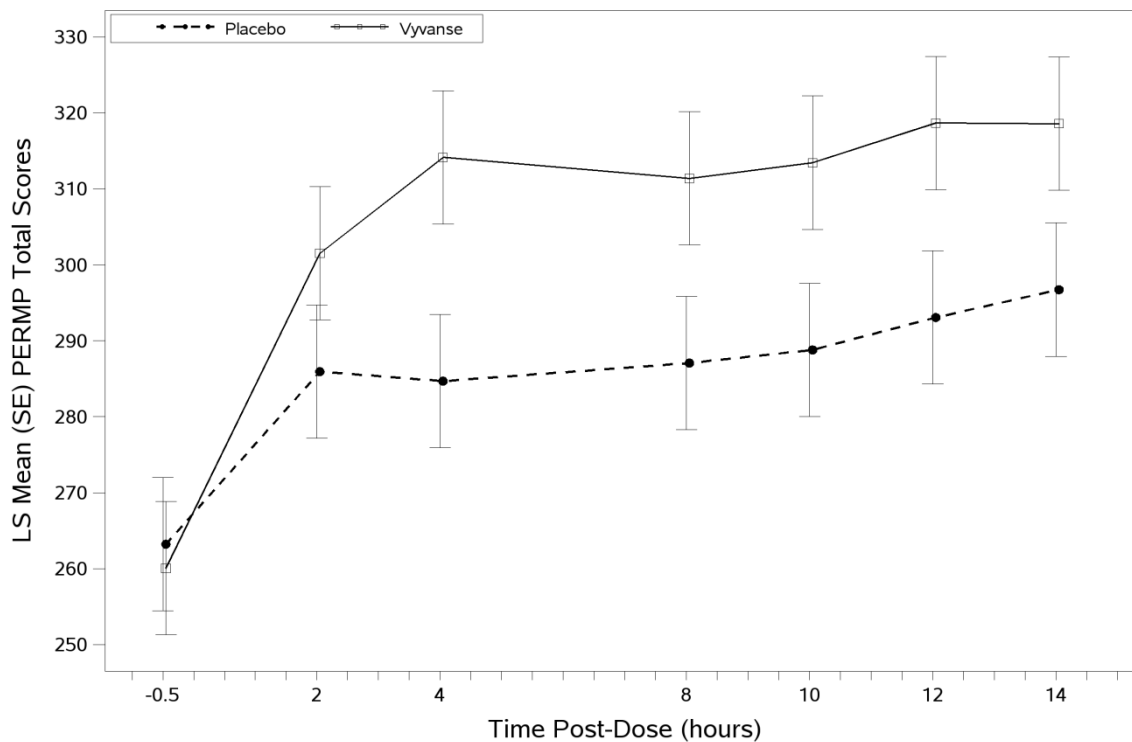


Higher score on the SKAMP-Department scale indicates more severe symptoms

**Figure 5 Kaplan-Meier Estimated Proportion of Patients with Treatment Failure for Pediatric Patients Ages 6 to 17 (Study 6)**

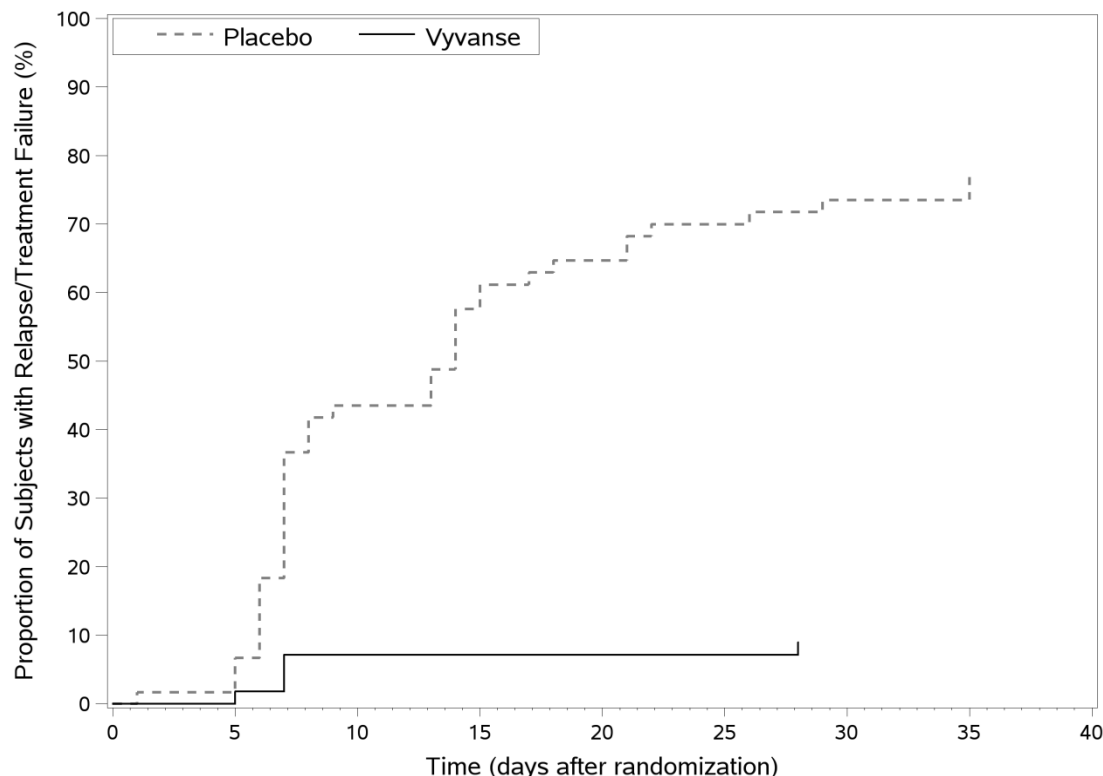


**Figure 6** LS Mean (SE) PERMP Total Score by Treatment and Time-point for Adults Ages 18 to 55 with ADHD after 1 Week of Double Blind Treatment (Study 8)



Higher score on the PERMP scale indicates less severe symptoms.

**Figure 7 Kaplan-Meier Estimated Proportion of Subjects with Relapse in Adults with ADHD (Study 9)**



## 14.2 Binge Eating Disorder (BED)

A phase 2 study evaluated the efficacy of VYVANSE 30, 50 and 70 mg/day compared to placebo in reducing the number of binge days/week in adults with at least moderate to severe BED. This randomized, double-blind, parallel-group, placebo-controlled, forced-dose titration study (Study 10) consisted of an 11-week double-blind treatment period (3 weeks of forced-dose titration followed by 8 weeks of dose maintenance). VYVANSE 30 mg/day was not statistically different from placebo on the primary endpoint. The 50 and 70 mg/day doses were statistically superior to placebo on the primary endpoint.

The efficacy of VYVANSE in the treatment of BED was demonstrated in two 12-week randomized, double-blind, multi-center, parallel-group, placebo-controlled, dose-optimization studies (Study 11 and Study 12) in adults aged 18-55 years (Study 11: N=374, Study 12: N=350) with moderate to severe BED. A diagnosis of BED was confirmed using DSM-IV criteria for BED. Severity of BED was determined based on having at least 3 binge days per week for 2 weeks prior to the baseline visit and on having a Clinical Global Impression Severity (CGI-S) score of  $\geq 4$  at the baseline visit. For both studies, a binge day was defined as a day with at least 1 binge episode, as determined from the subject's daily binge diary.

Both 12-week studies consisted of a 4-week dose-optimization period and an 8-week dose-maintenance period. During dose-optimization, subjects assigned to VYVANSE began



treatment at the titration dose of 30 mg/day and, after 1 week of treatment, were subsequently titrated to 50 mg/day. Additional increases to 70 mg/day were made as tolerated and clinically indicated. Following the dose-optimization period, subjects continued on their optimized dose for the duration of the dose-maintenance period.

The primary efficacy outcome for the two studies was defined as the change from baseline at Week 12 in the number of binge days per week. Baseline is defined as the weekly average of the number of binge days per week for the 14 days prior to the baseline visit. Subjects from both studies on VYVANSE had a statistically significantly greater reduction from baseline in mean number of binge days per week at Week 12. In addition, subjects on VYVANSE showed greater improvement as compared to placebo across key secondary outcomes with higher proportion of subjects rated improved on the CGI-I rating scale, higher proportion of subjects with 4-week binge cessation, and greater reduction in the Yale-Brown Obsessive Compulsive Scale Modified for Binge Eating (Y-BOCS-BE) total score.

**Table 7: Summary of Primary Efficacy Results in BED**

Study Number	Treatment Group	Primary Efficacy Measure: Binge Days per Week at Week 12		
		Mean Baseline Score (SD)	LS Mean Change from Baseline (SE)	Placebo-subtracted Difference <sup>a</sup> (95% CI)
Study 11	VYVANSE (50 or 70 mg/day)*	4.79 (1.27)	-3.87 (0.12)	-1.35 (-1.70, -1.01)
	Placebo	4.60 (1.21)	-2.51 (0.13)	--
Study 12	VYVANSE (50 or 70 mg/day)*	4.66 (1.27)	-3.92 (0.14)	-1.66 (-2.04, -1.28)
	Placebo	4.82 (1.42)	-2.26 (0.14)	--

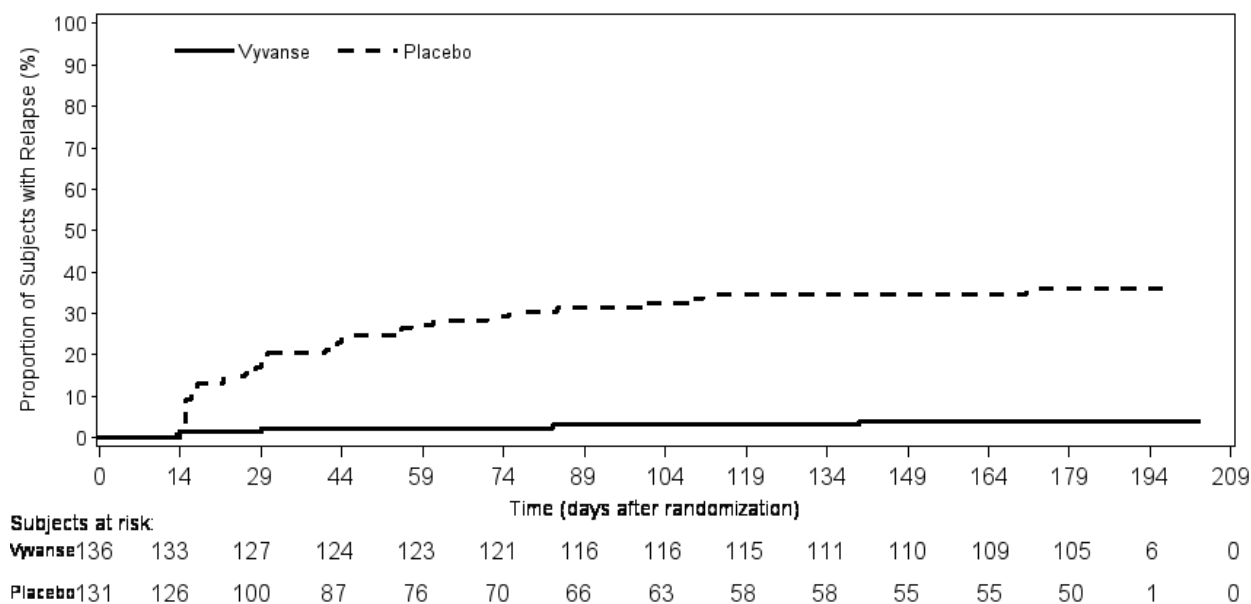
SD: standard deviation; SE: standard error; LS Mean: least-squares mean; CI: confidence interval.

<sup>a</sup> Difference (drug minus placebo) in least-squares mean change from baseline.

\* Doses statistically significantly superior to placebo.

A double-blind, placebo controlled, randomized withdrawal design study (Study 13) was conducted to evaluate maintenance of efficacy based on time to relapse between VYVANSE and placebo in adults aged 18 to 55 (N=267) with moderate to severe BED. In this longer-term study patients who had responded to VYVANSE in the preceding 12-week open-label treatment phase were randomized to continuation of VYVANSE or placebo for up to 26 weeks of observation for relapse. Response in the open-label phase was defined as 1 or fewer binge days each week for four consecutive weeks prior to the last visit at the end of the 12-week open-label phase and a CGI-S score of 2 or less at the same visit. Relapse during the double-blind phase was defined as having 2 or more binge days each week for two consecutive weeks (14 days) prior to any visit and having an increase in CGI-S score of 2 or more points compared to the randomized-withdrawal baseline. Maintenance of efficacy for patients who had an initial response during the open-label period and then continued on VYVANSE during the 26-week double-blind randomized-withdrawal phase was demonstrated with VYVANSE being superior over placebo as measured by time to relapse.

**Figure 8 Kaplan-Meier Estimated Proportions of Subjects with Relapse in Adults with BED (Study 13)**



Examination of population subgroups based on age (there were no patients over 65), gender, and race did not reveal any clear evidence of differential responsiveness in the treatment of BED.

## 16 HOW SUPPLIED/STORAGE AND HANDLING

### 16.1 How Supplied

VYVANSE (lisdexamfetamine dimesylate) capsules:

- VYVANSE capsules 10 mg: pink body/pink cap (imprinted with S489 and 10 mg), bottles of 100, NDC 59417-101-10
- VYVANSE capsules 20 mg: ivory body/ivory cap (imprinted with S489 and 20 mg), bottles of 100, NDC 59417-102-10
- VYVANSE capsules 30 mg: white body/orange cap (imprinted with S489 and 30 mg), bottles of 100, NDC 59417-103-10
- VYVANSE capsules 40 mg: white body/blue green cap (imprinted with S489 and 40 mg), bottles of 100, NDC 59417-104-10
- VYVANSE capsules 50 mg: white body/blue cap (imprinted with S489 and 50 mg), bottles of 100, NDC 59417-105-10
- VYVANSE capsules 60 mg: aqua blue body/aqua blue cap (imprinted with S489 and 60 mg), bottles of 100, NDC 59417-106-10

- VYVANSE capsules 70 mg: blue body/orange cap (imprinted with S489 and 70 mg), bottles of 100, NDC 59417-107-10

VYVANSE (lisdexamfetamine dimesylate) *chewable tablets*:

- VYVANSE chewable tablets 10 mg: White to off-white round shaped tablet debossed with '10' on one side and 'S489' on the other, bottles of 100, NDC 59417-115-01
- VYVANSE chewable tablets 20 mg: White to off-white hexagonal shaped tablet debossed with '20' on one side and 'S489' on the other, bottles of 100, NDC 59417-116-01
- VYVANSE chewable tablets 30 mg: White to off-white arc triangular shaped tablet debossed with '30' on one side and 'S489' on the other, bottles of 100, NDC 59417-117-01
- VYVANSE chewable tablets 40 mg: White to off-white capsule shaped tablet debossed with '40' on one side and 'S489' on the other, bottles of 100, NDC 59417-118-01
- VYVANSE chewable tablets 50 mg: White to off-white arc square shaped tablet debossed with '50' on one side and 'S489' on the other, bottles of 100, NDC 59417-119-01
- VYVANSE chewable tablets 60 mg: White to off-white arc diamond shaped tablet debossed with '60' on one side and 'S489' on the other, bottles of 100, NDC 59417-120-01

## 16.2 Storage and Handling

Dispense in a tight, light-resistant container as defined in the USP.

Store at room temperature, 20°C to 25°C (68°F to 77°F). Excursions permitted between 15°C and 30°C (59 to 86°F) [see USP Controlled Room Temperature].

### Disposal

Comply with local laws and regulations on drug disposal of CNS stimulants. Dispose of remaining, unused, or expired VYVANSE by a medicine take-back program.

## 17 PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Medication Guide).

### Controlled Substance Status/High Potential for Abuse and Dependence

Advise patients that VYVANSE is a controlled substance and it can be abused and lead to dependence and not to give VYVANSE to anyone else [see *Drug Abuse and Dependence* (9.1, 9.2, and 9.3)]. Advise patients to store VYVANSE in a safe place, preferably locked, to prevent abuse. Advise patients to dispose of remaining, unused, or expired VYVANSE by a medicine take-back program.

### Serious Cardiovascular Risks

Advise patients that there is a potential serious cardiovascular risk including sudden death, myocardial infarction, stroke, and hypertension with VYVANSE use. Instruct patients to contact

a healthcare provider immediately if they develop symptoms such as exertional chest pain, unexplained syncope, or other symptoms suggestive of cardiac disease [*see Warnings and Precautions (5.2)*].

#### Hypertension and Tachycardia

Instruct patients that VYVANSE can cause elevations of their blood pressure and pulse rate and they should be monitored for such effects.

#### Psychiatric Risks

Advise patients that VYVANSE at recommended doses may cause psychotic or manic symptoms even in patients without prior history of psychotic symptoms or mania [*see Warnings and Precautions (5.4)*].

#### Suppression of Growth

Advise patients that VYVANSE may cause slowing of growth including weight loss [*see Warnings and Precautions (5.5)*].

#### Impairment in Ability to Operate Machinery or Vehicles

Advise patients that VYVANSE may impair their ability to engage in potentially dangerous activities such as operating machinery or vehicles. Instruct patients to find out how VYVANSE will affect them before engaging in potentially dangerous activities [*see Adverse Reactions (6.1, 6.2)*].

#### Circulation problems in fingers and toes [Peripheral vasculopathy, including Raynaud's phenomenon]

Instruct patients beginning treatment with VYVANSE about the risk of peripheral vasculopathy, including Raynaud's phenomenon, and associated signs and symptoms: fingers or toes may feel numb, cool, painful, and/or may change from pale, to blue, to red. Instruct patients to report to their physician any new numbness, pain, skin color change, or sensitivity to temperature in fingers or toes. Instruct patients to call their physician immediately with any signs of unexplained wounds appearing on fingers or toes while taking VYVANSE. Further clinical evaluation (e.g., rheumatology referral) may be appropriate for certain patients [*see Warnings and Precautions (5.6)*].

#### Serotonin Syndrome

Caution patients about the risk of serotonin syndrome with concomitant use of VYVANSE and other serotonergic drugs including SSRIs, SNRIs, triptans, tricyclic antidepressants, fentanyl, lithium, tramadol, tryptophan, buspirone, St. John's Wort, and with drugs that impair metabolism of serotonin (in particular MAOIs, both those intended to treat psychiatric disorders and also others such as linezolid [*see Contraindications (4), Warnings and Precautions (5.7) and Drug Interactions (7.1)*]). Advise patients to contact their healthcare provider or report to the emergency room if they experience signs or symptoms of serotonin syndrome.

#### Concomitant Medications

Advise patients to notify their physicians if they are taking, or plan to take, any prescription or over-the-counter drugs because there is a potential for interactions [*see Drug Interactions (7.1)*].

### Pregnancy

Advise patients of the potential fetal effects from the use of VYVANSE during pregnancy.

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

### Lactation

Advise women not to breastfeed if they are taking VYVANSE [see *Use in Specific Populations* (8.2)].

### Administration Instructions

- Capsules: Advise patients to take the capsules whole or empty and mix the entire contents with yogurt, water, or orange juice. Advise patients to consume the mixture immediately and not to store for future use [see *Dosage and Administration* (2.2)].
- Chewable tablets: Advise patients that chewable tablets must be chewed thoroughly before swallowing [see *Dosage and Administration* (2.2)].

Distributed by:

Takeda Pharmaceuticals America, Inc.  
Lexington, MA 02421

Made in USA

For more information call 1-800-828-2088

VYVANSE® and the VYVANSE Logo® are registered trademarks of Takeda Pharmaceuticals U.S.A., Inc.

©2021 Takeda Pharmaceuticals U.S.A., Inc. All rights reserved.

US Pat No. 7,105,486, 7,223,735, 7,655,630, 7,659,253, 7,659,254, 7,662,787, 7,662,788, 7,671,030, 7,671,031, 7,674,774, 7,678,770, 7,678,771, 7,687,466, 7,687,467, 7,713,936, 7,718,619, 7,723,305

**MEDICATION GUIDE**  
**VYVANSE® (Vi' – vans)**  
**(lisdexamfetamine dimesylate)**  
**Capsules and Chewable Tablets, CII**

**What is the most important information I should know about VYVANSE?**

**VYVANSE may cause serious side effects, including:**

- **Abuse and dependence.** VYVANSE, other amphetamine containing medicines, and methylphenidate have a high chance for abuse and may cause physical and psychological dependence. Your healthcare provider should check you or your child for signs of abuse and dependence before and during treatment with VYVANSE.
  - Tell your healthcare provider if you or your child have ever abused or been dependent on alcohol, prescription medicines, or street drugs.
  - Your healthcare provider can tell you more about the differences between physical and psychological dependence and drug addiction.

- **Heart-related problems including:**

- sudden death, stroke, and heart attack in adults
- sudden death in children who have heart problems or heart defects
- increased blood pressure and heart rate

Your healthcare provider should check you or your child carefully for heart problems before starting treatment with VYVANSE. Tell your healthcare provider if you or your child have any heart problems, heart defects, high blood pressure, or a family history of these problems.

Your healthcare provider should check your or your child's blood pressure and heart rate regularly during treatment with VYVANSE.

**Call your healthcare provider or go to the nearest hospital emergency room right away if you or your child have any signs of heart problems such as chest pain, shortness of breath, or fainting during treatment with VYVANSE.**

- **Mental (psychiatric) problems, including:**

- new or worse behavior and thought problems
- new or worse bipolar illness
- new psychotic symptoms (such as hearing voices, or seeing or believing things that are not real) or new manic symptoms

Tell your healthcare provider about any mental problems you or your child have or about a family history of suicide, bipolar illness, or depression.

**Call your healthcare provider right away if you or your child have any new or worsening mental symptoms or problems during treatment with VYVANSE, especially hearing voices, seeing or believing things that are not real, or new manic symptoms.**

**What is VYVANSE?**

VYVANSE is a central nervous system (CNS) stimulant prescription medicine used for the treatment of:

- Attention Deficit Hyperactivity Disorder (ADHD) in adults and children 6 years of age and older. VYVANSE may help increase attention and decrease impulsiveness and hyperactivity in people with ADHD.
- Moderate to severe binge eating disorder (BED) in adults. VYVANSE may help reduce the number of binge eating days in people with BED.

**VYVANSE is not for use in children under 6 years of age with ADHD.**

VYVANSE is not for weight loss. It is not known if VYVANSE is safe and effective for the treatment of obesity.

It is not known if VYVANSE is safe and effective for use in children with BED.

**VYVANSE is a federally controlled substance (CII) because it contains lisdexamfetamine dimesylate that can be a target for people who abuse prescription medicines or street drugs.** Keep VYVANSE in a safe place to protect it from theft. Never give your VYVANSE to anyone else because it may cause death or harm them. Selling or giving away VYVANSE may harm others and is against the law.

**Do not take VYVANSE if you or your child are:**

- allergic to amphetamine products or any of the ingredients in VYVANSE. See the end of this Medication Guide for a complete list of ingredients in VYVANSE.
- taking, or have stopped taking in the last 14 days, a medicine called a Monoamine Oxidase Inhibitor (MAOI).
- being treated with the antibiotic linezolid or intravenous methylene blue.

**Before taking VYVANSE, tell your healthcare provider about all medical conditions, including if you or your child:**

- have heart problems, heart defects, or high blood pressure
- have mental problems including psychosis, mania, bipolar illness, or depression or have a family history of suicide, bipolar illness, or depression
- have circulation problems in fingers and toes
- are pregnant or plan to become pregnant. VYVANSE may harm the unborn baby.
  - There is a pregnancy registry for females who are exposed to VYVANSE during pregnancy. The purpose of the registry is to collect information about the health of females exposed to VYVANSE and their baby. If you or your child becomes pregnant during treatment with VYVANSE, talk to your healthcare provider about registering with the National Pregnancy Registry for Psychostimulants at 1-866-961-2388 or visit online at <https://womensmentalhealth.org/clinical-and-research-programs/pregnancyregistry/adhd-medications/>.
- are breastfeeding or plan to breastfeed. VYVANSE passes into breast milk. You should not breastfeed during treatment with VYVANSE. Talk to your healthcare provider about the best way to feed the baby during treatment with VYVANSE.

**Tell your healthcare provider about all the medicines that you or your child take**, including prescription and over-the-counter medicines, vitamins, and herbal supplements.

VYVANSE can affect the way other medicines work and other medicines may affect how VYVANSE works. Taking VYVANSE with other medicines can cause serious side effects. Sometimes the doses of other medicines will need to be changed while taking VYVANSE.

**Especially tell your healthcare provider if you or your child take:**

- |  |  |
|--|--|
| • selective serotonin reuptake inhibitors (SSRIs)            | • serotonin norepinephrine reuptake inhibitors (SNRIs) |
| • medicines used to treat migraine headaches called triptans | • tricyclic antidepressants                            |
| • lithium  | • fentanyl   |
| • tramadol   | • tryptophan   |
| • buspirone  | • St. John's Wort                                      |

Keep a list of all medicines to show your healthcare provider and pharmacist when you get a new medicine. Your healthcare provider will decide if VYVANSE can be taken with other medicines.

**Do not start any new medicine during treatment with VYVANSE without talking to your healthcare provider first.**

**How should VYVANSE be taken?**

- Take VYVANSE exactly as prescribed by your healthcare provider.
- Your healthcare provider may change the dose if needed.
- Take VYVANSE 1 time each day in the morning with or without food.
- Your healthcare provider may sometimes stop VYVANSE treatment for a while to check ADHD or BED symptoms.
- VYVANSE comes in capsules or chewable tablets.

**Taking VYVANSE Capsules:**

- VYVANSE capsules may be swallowed whole.
- If VYVANSE capsules cannot be swallowed whole, the capsule may be opened and the entire contents sprinkled onto yogurt, or poured into water or orange juice.



- Using a spoon, break apart any powder that is stuck together. Stir the VYVANSE powder and yogurt, water, or orange juice until they are completely mixed together.
- Swallow all the yogurt, water, or orange juice mixture right away. **Do not** store the yogurt, water, or orange juice mixture.
- It is normal to see a filmy coating on the inside of your glass or container after you eat or drink all the VYVANSE mixture.

**Taking VYVANSE Chewable Tablets:**

- Chew VYVANSE tablets completely before swallowing.

If you or your child take too much VYVANSE, call your healthcare provider or poison control center at 1-800-222-1222 or go to the nearest hospital emergency room right away.

**What should I avoid while taking VYVANSE?**

Do not drive, operate machinery, or do other dangerous activities until you know how VYVANSE affects you.

**What are the possible side effects of VYVANSE?**

**VYVANSE may cause serious side effects, including:**

- See “What is the most important information I should know about VYVANSE?”
- **Slowing of growth (height and weight) in children.** Children should have their height and weight checked often during treatment with VYVANSE. VYVANSE treatment may be stopped if your child is not growing or gaining weight.
- **Circulation problems in fingers and toes (Peripheral vasculopathy, including Raynaud’s phenomenon).**  
Signs and symptoms may include:
  - Fingers or toes may feel numb, cool, painful
  - Fingers or toes may change color from pale, to blue, to redTell your healthcare provider if you or your child have numbness, pain, skin color change, or sensitivity to temperature in your fingers or toes.  
Call your healthcare provider right away if you or your child have any signs of unexplained wounds appearing on fingers or toes during treatment with VYVANSE.
- **Serotonin Syndrome.** A potentially life-threatening problem called serotonin syndrome may happen when VYVANSE is taken with certain other medicines. Stop taking VYVANSE and call your healthcare provider or go to the nearest hospital emergency room right away if you or your child develop any of the following signs and symptoms of serotonin syndrome:

<ul style="list-style-type: none"><li>○ agitation</li><li>○ flushing</li><li>○ coma</li><li>○ loss of coordination</li><li>○ dizziness</li><li>○ seeing or hearing things that are not real (hallucination)</li><li>○ high body temperature (hyperthermia)</li></ul>	<ul style="list-style-type: none"><li>○ fast heartbeat</li><li>○ seizures</li><li>○ sweating</li><li>○ confusion</li><li>○ tremors, stiff muscles, or muscle twitching</li><li>○ changes in blood pressure</li><li>○ nausea, vomiting, diarrhea</li></ul>
--	---

**The most common side effects of VYVANSE in children 6 to 17 years old and adults with ADHD include:**

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• loss of appetite (anorexia)</li><li>• decreased appetite</li><li>• diarrhea</li><li>• dry mouth</li><li>• trouble sleeping</li><li>• stomach pain</li></ul> | <ul style="list-style-type: none"><li>• anxiety</li><li>• weight loss</li><li>• dizziness</li><li>• irritability</li><li>• nausea</li><li>• vomiting</li></ul> |
|---|--|

**The most common side effects of VYVANSE in adults with BED include:**

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• dry mouth</li></ul> | <ul style="list-style-type: none"><li>• trouble sleeping</li></ul> |
|---|--|

- decreased appetite
- constipation
- anxiety
- increased heart rate
- feeling jittery

These are not all the possible side effects of VYVANSE.

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 VYVANSE?

- Store VYVANSE in a safe place (like a locked cabinet) and in a tightly closed container at room temperature between 68°F to 77°F (20°C to 25°C).
- Protect VYVANSE from light.
- Dispose of remaining, unused, or expired VYVANSE by a medicine take-back program at authorized collection sites such as retail pharmacies, hospital or clinic pharmacies, and law enforcement locations. If no take-back program or authorized collector is available, mix VYVANSE with an undesirable, nontoxic substance such as dirt, cat litter, or used coffee grounds to make it less appealing to children and pets. Place the mixture in a container such as a sealed plastic bag and throw away (discard) VYVANSE in the household trash.

#### Keep VYVANSE and all medicines out of the reach of children.

#### General information about the safe and effective use of VYVANSE.

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

#### What are the ingredients in VYVANSE?

**Active ingredient:** lisdexamfetamine dimesylate

**Capsule Inactive ingredients:** microcrystalline cellulose, croscarmellose sodium, and magnesium stearate. The capsule shells (imprinted with S489) contain gelatin, titanium dioxide, and one or more of the following: FD&C Red #3, FD&C Yellow #6, FD&C Blue #1, Black Iron Oxide, and Yellow Iron Oxide.

**Chewable Tablet Inactive Ingredients:** colloidal silicon dioxide, croscarmellose sodium, guar gum, magnesium stearate, mannitol, microcrystalline cellulose, sucralose, artificial strawberry flavor.

Distributed by: Takeda Pharmaceuticals America, Inc., Lexington, MA 02421. VYVANSE® and the VYVANSE Logo® are registered trademarks of Takeda Pharmaceuticals U.S.A., Inc. © 2021 Takeda Pharmaceuticals U.S.A., Inc. All rights reserved.

For more information, go to [www.vyvanse.com](http://www.vyvanse.com) or call 1-800-828-2088.

This Medication Guide has been approved by the U.S. Food and Drug Administration.

Revised: 10/2021