**APPROVED PROFESSIONAL INFORMATION**

**AMFETAMINES HAVE A HIGH POTENTIAL FOR ABUSE. ADMINISTRATION OF AMFETAMINES FOR PROLONGED PERIODS OF TIME MAY LEAD TO MEDICINE DEPENDENCE. MISUSE OF AMFETAMINE MAY CAUSE SUDDEN DEATH AND SERIOUS CARDIOVASCULAR ADVERSE EVENTS.**

## SCHEDULING STATUS

**S6**

## 1 NAME OF THE MEDICINE

**VYVANSE®** 30 (Lisdexamfetamine dimesilate) Capsules

**VYVANSE®** 50 (Lisdexamfetamine dimesilate) Capsules,

**VYVANSE®** 70 (Lisdexamfetamine dimesilate) Capsules

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

VYVANSE capsules contain 30 mg, 50 mg, or 70 mg of lisdexamfetamine dimesilate as the active ingredient

Sugar Free

For the full list of excipients, see Section 6.1 List of excipients.

## 3 PHARMACEUTICAL FORM

Capsules (hard)

**Appearance**

VYVANSE 30 capsules: white opaque body and pink opaque cap, printed ‘S489’ and ‘30 mg’ in black ink.

VYVANSE 50 capsules: white opaque body and blue opaque cap, printed ‘S489’ and ‘50 mg’ in black ink.

VYVANSE 70 capsules: blue opaque body and pink opaque cap, printed ‘S489’ and ‘70 mg’ in black ink.

# 4 CLINICAL PARTICULARS

## 4.1 Therapeutic indications

**Attention Deficit Hyperactivity Disorder (ADHD)**

VYVANSE is indicated for the treatment of Attention Deficit Hyperactivity Disorder. Diagnosed according to the most recent DSM diagnostic criteria for ADHD in patients ≥ 13 years of age up to 55 years of age when treatment with methylphenidate and atomoxetine has failed. Treatment with VYVANSE should be part of a comprehensive treatment program for ADHD.

Long term use:

The need for continuation of treatment with VYVANSE should be re-assessed every 6 months.

## 4.2 Posology and method of administration

Treatment should be initiated and supervised by a medical practitioner experienced in treatment of patients with ADHD. Patients should be reviewed at least every 6 months to assess if there is an on-going need for treatment with VYVANSE. Blood pressure and cardiovascular status should also be regularly reviewed.

Dosage should be individualised according to the therapeutic needs and response of the patient. Careful dose titration is necessary at the start of treatment with VYVANSE.

VYVANSE should be administered orally at the lowest possible dosage and should then be slowly adjusted to the lowest effective dose for each individual.

VYVANSE should be taken in the morning with or without food; avoid afternoon doses because of the potential for insomnia.

VYVANSE capsules may be taken whole, or the capsule may be opened and the entire contents emptied and mixed with a soft food such as yogurt or in a glass of water or orange juice. If the contents of the capsule include any compacted powder, a spoon may be used to break apart the powder in the soft food or liquid. The contents should be mixed until completely dispersed. The patient should consume the entire mixture of soft food or liquid 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. The patient should not take anything less than one capsule per day and a single capsule should not be divided.

The maximum recommended dose is 70 mg/day; doses greater than 70 mg/day of VYVANSE have not been studied. The effectiveness of VYVANSE has not been established in adults over 55 years of age. Due to reduced clearance in patients with severe renal insufficiency (GFR 15

to <30 mL/min/1,73 $m^2$) the maximum daily dose should not exceed 50 mg. Further dosage reduction should be considered in patients undergoing dialysis (See Section 5.2 Pharmacokinetic properties, Special populations and Section 4.4 Special Warnings and Precautions For Use).

Lisdexamfetamine and dexamfetamine are not dialysable.

VYVANSE should not be used in children under the age of 13 years as the available formulations are not appropriate for up or down titration to find an optimal dose in children aged 6-12 years. Safety and efficacy in children under the age of 6 years have not been established

**Treatment of ADHD**

In patients who are either starting treatment for the first time or switching from another medication, 30 mg once daily in the morning is the recommended starting dose. If the decision is made to increase the dose beyond 30 mg/day, daily dosage may be adjusted in increments of 20 mg at weekly intervals. VYVANSE should be administered orally at the lowest possible dosage.

VYVANSE has not been studied in children under 6 years of age and up or down titration in children 6 to 12 years of age to optimise the dose needed cannot be achieved with the current available formulations.

## 4.3 Contraindications

VYVANSE is contraindicated in patients with:

- Known hypersensitivity to sympathomimetic amines or any of the excipients listed in Section 6.1.
- Advanced arteriosclerosis
- Symptomatic cardiovascular disease including cardiac dysrhythmias, ischaemic heart disease and other structural and/or functional cardiac disorders. Moderate to severe hypertension
- Hyperthyroidism or thyrotoxicosis
- Glaucoma
- Agitated states
- Concomitant use of monoamine oxidase inhibitors (MAOIs) or within 14 days after MAOIs treatment including MAOIs such as linezolid or intravenous methylene blue (risk of

hypertensive crisis).

- Phaeochromatocytoma
- Tics, Tourette's syndrome
- Patients with severe depression, anorexia nervosa, psychotic symptoms or suicidal tendency
- Patients with known drug dependence or alcohol abuse
- Pregnancy and lactation (see Section 4.6 Pregnancy, Lactation and Fertility)

## 4.4 Special Warnings and Precautions For Use

**VYVANSE has a potential for abuse, misuse, dependence, or diversion for non-therapeutic uses. Medical practitioners should assess the risk of abuse prior to prescribing and monitor for signs of abuse and dependence while on therapy. VYVANSE should be prescribed cautiously to patients with a history of substance abuse or dependence. Careful supervision is required during withdrawal from abusive use since severe depression may occur. Withdrawal following chronic therapeutic use may unmask symptoms of the underlying disorder that may require follow-up.**

**Stimulants including VYVANSE have a potential for abuse, misuse, or diversion that medical practitioners should consider when prescribing VYVANSE. The risk of misuse may be greater in adults (especially young adults) than in paediatric use. Stimulants should be prescribed cautiously to patients with a history of substance abuse or dependence.**

Patients should be cautioned against increasing the recommended dosage. Should psychological and/or physical dependence occur, gradual withdrawal of the medication is recommended. Abrupt cessation following prolonged high dosage results in extreme fatigue and mental depression; changes have also been noted on the sleep electro-encephalogram (EEG).

Manifestations of chronic intoxication with amfetamines include severe dermatoses, marked insomnia, irritability, hyperactivity and personality changes. The most severe manifestation of chronic intoxication is psychosis, often clinically indistinguishable from schizophrenia.

**Pre-treatment assessment**

Before starting treatment with VYVANSE, it is important to consider the patient's personal and family cardiac and psychiatric history. In patients with identified or potential cardiovascular or

psychiatric risk factors, further investigation or specialist review may be considered.

Children, adolescents, or adults who are being considered for treatment with stimulant medications should have a careful history (including assessment for a family history of sudden death or ventricular dysrhythmias) and physical examination to assess for the presence of cardiac disease, and should receive further cardiac evaluation if findings suggest such disease (e.g. electrocardiogram and echocardiogram). Patients who develop symptoms such as exertional chest pain, unexplained syncope, or other symptoms suggestive of cardiac disease during stimulant treatment should undergo a prompt cardiac evaluation.

**Cardiovascular disease**

Serious cardiovascular events have been reported with the use of sympathomimetic medicines, including VYVANSE, in the ADHD population.

***Sudden death and pre-existing structural cardiac abnormalities or other serious heart problems***

Children and Adolescents:

Sudden death has been reported in children and adolescents taking CNS stimulants at usual doses, including those with structural cardiac abnormalities or other serious heart problems. Although some serious heart problems alone carry an increased risk of sudden death, stimulant products generally should not be used in children or adolescents with known serious structural cardiac abnormalities, cardiomyopathy, serious heart rhythm abnormalities, or other serious cardiac problems that may place them at increased vulnerability to the sympathomimetic effects of a stimulant medicine.

Adults:

Sudden deaths, stroke, and myocardial infarction have been reported in adults taking stimulant medicines at usual doses for ADHD. Although the role of stimulants in these adult cases is also unknown, adults have a greater likelihood than children of having serious structural cardiac abnormalities, cardiomyopathy, serious heart rhythm abnormalities, coronary artery disease, or other serious cardiac problems. Adults with such abnormalities should also generally not be treated with stimulant medicines.

**Hypertension and other cardiovascular conditions**

Stimulant medications cause a modest increase in average mean blood pressure (about 2-4 mm Hg) and mean heart rate (about 3-6 bpm), and individuals may have larger increases.

Patients should be monitored for larger changes in heart rate and blood pressure. Caution is indicated in treating patients whose underlying medical conditions might be compromised by increases in blood pressure or heart rate, e.g. those with pre-existing hypertension, heart failure, recent myocardial infarction, or ventricular dysrhythmias.

Lisdexamfetamine has shown to prolong the QTc interval in some patients. It should be used with caution in patients with prolongation of the QTc interval, in patients treated with drugs affecting the QTc interval, or in patients with relevant pre-existing cardiac disease or electrolyte disturbances.

**Psychiatric disorders**

Pre-existing psychosis

Administration of stimulants may exacerbate symptoms of behaviour disturbance and thought disorder in patients with pre-existing psychotic disorder.

**Bipolar illness**

Particular care should be taken in using stimulants to treat ADHD patients with comorbid bipolar disorder because of concern for possible induction of mixed/manic episode in such patients. Prior to initiating treatment with a stimulant, patients with comorbid depressive symptoms should be adequately screened to determine if they are at risk for bipolar disorder; such screening should include a detailed psychiatric history, including a family history of suicide, bipolar disorder, and depression.

**Emergence of new psychotic or manic symptoms**

Treatment emergent psychotic or manic symptoms, e.g., hallucinations, delusional thinking, or mania in children and adolescents without prior history of psychotic illness or mania can be caused by stimulants at usual doses. If such symptoms occur, consideration should be given to a possible causal role of the stimulant, and discontinuation of treatment may be appropriate.

**Aggression**

Aggressive behaviour or hostility is often observed in children and adolescents with ADHD, and has been reported in clinical trials and the post-marketing experience of some medications indicated for the treatment of ADHD, including VYVANSE. Stimulants may cause aggressive behaviour or hostility. Patients beginning treatment for ADHD should be monitored for the appearance of or worsening of aggressive behaviour or hostility.

**Seizures**

Stimulants may lower the convulsive threshold in patients with prior history of seizure, in patients with prior EEG abnormalities without previous seizures, and in patients without a history of seizures and no prior EEG evidence of seizures. In the presence of seizures, VYVANSE should be discontinued.

**Visual disturbance**

Difficulties with accommodation and blurring of vision have been reported with stimulant treatment such as with VYVANSE.

**Tics**

Stimulants have been reported to exacerbate motor and phonic tics and Tourette's syndrome. Therefore, clinical evaluation for tics and Tourette's syndrome in children and their families should precede the use of stimulant medications. (see Section 4.3 Contraindications)

**Long-term suppression of growth (height and weight)**

VYVANSE was associated with dose-related reductions in weight in children, adolescents and adults in short-term studies. Although a causal relationship has not been established, suppression of growth (i.e. weight and/or height) has been reported with the long-term use of stimulants in children. Therefore, patients requiring long-term therapy should be carefully monitored. Patients who are not growing or gaining weight as expected should have their treatment interrupted.

**Peripheral vasculopathy, including Raynaud's Phenomenon**

Stimulants, including Vyvanse, used to treat ADHD 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, have been 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 the medicine. Careful observation for digital changes is necessary during treatment with ADHD stimulants. Further clinical evaluation (e.g. rheumatology referral) may be appropriate for certain patients.

**Prescribing and dispensing**

The least amount of VYVANSE feasible should be prescribed or dispensed at one time in order

to minimise the possibility of overdosage. Consideration should be given when using VYVANSE in patients who use other sympathomimetic medicines.

**Paediatric use**

**ADHD**

VYVANSE should not be used in children under the age of 13 years. Current available formulation do not allow optimisation of the dose requirements (best benefit risk balance) for children 6 -12 years. Safety and efficacy of VYVANSE in children under the age of 6 years have not been established.

**Adult patients aged over 55 years**

VYVANSE safety and efficacy have not been established in adult patients over the age of 55 years.

**Use in hepatic impairment**

No studies have been conducted in patients with hepatic impairment.

**Use in renal impairment**

Due to reduced clearance in patients with severe renal impairment (GFR 15 to <30 mL/min/1,73 $m^2$) the maximum VYVANSE daily dose should not exceed 50 mg. Further dosage reduction should be considered in patients undergoing dialysis. See Section 5 PHARMACOLOGICAL PROPERTIES, Special populations.

Lisdexamfetamine and dexamfetamine are not dialysable.

**Effects on laboratory tests**

Amfetamines, such as VYVANSE can cause a significant elevation in plasma corticosteroid levels. This increase is greatest in the evening. Amfetamine may interfere with urinary steroid determinations.

**Use with other sympathomimetic drugs**

VYVANSE should be used with caution in patients who use other sympathomimetic drugs (see section 4.5).

**Excipients**

This medicine contains less than 1 mmol sodium (23 mg) per capsule, that is to say essentially ‘sodium-free’.

## 4.5 Interaction with Other Medicines and Other Forms of Interaction

***In vitro* enzyme inhibition**

VYVANSE was not an in vitro inhibitor of the major human CYP450 isoforms (CYP1A2, CYP2A6, CYP2B6, CYP2C8, CYP2C9, CYP2C19, CYP2D6, and CYP3A4) in human hepatic microsomal suspensions, nor was it an *in vitro* inducer of CYP1A2, CYP2B6 or CYP3A4/5 in cultured fresh human hepatocytes. VYVANSE was not an *in vitro* substrate for P-gp in MDCKII cells nor an *in vitro* inhibitor of P-gp in Caco-2 cells and is therefore unlikely to be involved in clinical interactions with drugs transported by the P-gp pump.

**Medicines whose blood levels may be impacted by VYVANSE**

**Extended release guanfacine**:

In a drug interaction study, administration of an extended release guanfacine in combination with VYVANSE induced a 19 % increase in guanfacine maximum plasma concentrations, whereas, exposure (area under the curve; AUC) was increased by 7 %. These small changes are not expected to be clinically meaningful. In this study, no effect on dexamfetamine exposure was observed following co-administration of extended release guanfacine and VYVANSE.

**Extended release venlafaxine:**

In a drug interaction study, administration of 225 mg extended release venlafaxine, a CYP2D6 substrate, in combination with 70 mg VYVANSE induced a 9 % decrease in the Cmax and 17 % decrease in the AUC for the primary active metabolite o-desmetylvenlafaxine and a 10 % increase in Cmax and 13 % increase in AUC for venlafaxine. VYVANSE may be a weak inhibitor of CYP2D6. Lisdexamfetamine has no effect on the AUC and Cmax of the composite of venlafaxine and o-desmetylvenlafaxine. These small changes are not expected to be clinically meaningful. In this study, no effect on dexamfetamine exposure was observed following co-administration of extended release venlafaxine and VYVANSE.

**Medicines and conditions that alter urinary pH and impact the urinary excretion and half-life of amfetamine**

Ascorbic acid and other medicines or conditions that acidify urine increase urinary excretion and decrease the half-life of amfetamine.

Sodium bicarbonate and other medicines or conditions that alkalinise urine decrease urinary excretion and extend the half-life of amfetamine.

**Monoamine oxidase inhibitors**

Do not administer VYVANSE concomitantly with MAOIs or within 14 days after discontinuing MAOIs treatment. Concomitant use of MAOIs and CNS stimulants, such as VYVANSE, can cause hypertensive crisis. Severe outcomes including death may occur (See Section 4.3 Contraindications).

**Serotonergic medicines**

Serotonin syndrome can occur in association with the use of amfetamines such as VYVANSE, when given in conjunction with serotonergic medicines, including selective serotonin reuptake inhibitors (SSRIs), serotonin and norepinephrine (noradrenaline) reuptake inhibitors (SNRIs). It has also been reported in association with overdose of amfetamines, including VYVANSE (See Section 4.9 Overdosage).

**Medicines whose effects may be reduced by amfetamines**

Anti-hypertensives: Amfetamines may decrease the effectiveness of antihypertensive medications.

**Medicines whose effects may be potentiated by amfetamines**

Amfetamines, such as VYVANSE potentiate the analgesic effect of narcotic analgesics.

**Medicines that may reduce the effects of amfetamines**

**Chlorpromazine:**

Chlorpromazine blocks dopamine and norepinephrine (noradrenaline) receptors, thus inhibiting the central stimulant effects of amfetamines.

**Haloperidol:**

Haloperidol blocks dopamine receptors, thus inhibiting the central stimulant effects of amfetamines.

**Lithium Carbonate:**

The anorectic and stimulatory effects of amfetamines may be inhibited by lithium carbonate.

**Use with alcohol**

There are limited data on the possible interaction with alcohol.

## 4.6 Pregnancy, Lactation and Fertility

### Pregnancy

VYVANSE should not be used in pregnancy as harm to the foetus cannot be excluded. Dexamfetamine, the active metabolite of lisdexamfetamine, crosses the placenta. Amfetamines such as VYVANSE cause vasoconstriction and may decrease placental perfusion which may affect the developing foetus. It also stimulates uterine contractions increasing the risk of premature delivery and low birth weight babies. There is some evidence, although inconclusive, that amfetamine use in early pregnancy, may be associated with an increased risk of pre-eclampsia.

Women of childbearing age being treated with VYVANSE should be advised not to become pregnant.

### Effects on infants

Infants born to mothers taking amfetamines should be monitored for symptoms of withdrawal such as feeding difficulties, irritability, agitation and excessive drowsiness.

### Effects on embryo-foetal development

In animal reproduction studies, VYVANSE had no apparent effects on embryo foetal 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 resulted in respective plasma dexamfetamine AUC values which were 5 and 2 fold the AUC expected in adults at the maximum recommended dose of 70 mg, and respective plasma lisdexamfetamine AUC values which were 12 and 40 fold the AUC expected in adults at the maximum recommended dose.

A study of VYVANSE has not been conducted in rats treated throughout gestation and lactation. Amfetamine sulphate (d- to l- enantiomer ratio of 3:1), when given orally to rats from early gestation through to weaning at doses of 2, 6 and 10 mg total amfetamine base/kg/day, reduced the number of live born pups and pup viability during lactation. Body weight gain of offspring was reduced during lactation and after weaning, development was delayed, and increases in locomotor activity were observed. The reproductive performance of the offspring was also reduced. Some effects were observed at the 2 mg/kg/day dose, which was associated with a plasma amfetamine AUC about half that expected in adults at the maximum recommended dose of 70 mg.

**Lactation**

Women on treatment with VYVANSE should not breastfeed their infants.

Amfetamines are excreted in human milk. There is a risk of severe adverse reactions in the infant including cardiovascular reactions, blood pressure and heart rate increases, suppression of growth and peripheral vasculopathy. Long term neurodevelopmental effects on infants from amfetamine exposure are unknown**.**

**Fertility**

The effect of VYVANSE on human fertility has not been investigated. The effects of VYVANSE on fertility and early embryonic development have not been investigated in animal reproductive studies. Amfetamine has shown no harmful effects on fertility in a rat study. Amfetamine (d- to l-enantiomer ratio of 3:1) did not adversely affect fertility or early embryonic development in the rat at oral doses of up to 20 mg total amfetamine base/kg/day. This dose resulted in a plasma amfetamine AUC which was 4 (males) and 6 (females) fold the AUC expected in adults at the maximum recommended dose of 70 mg.

## 4.7 Effects on Ability to Drive and Use Machines

VYVANSE may affect the ability of patients to drive or use machinery. Patients should not drive or use machinery until they know how treatment with VYVANSE affects them. VYVANSE can cause dizziness, drowsiness and visual disturbances including difficulties with accommodation, diplopia and blurred vision.

## 4.8 Undesirable Effects

Tables 1 - 3 present common adverse drug reactions (ADRs) reported in parallel-group, controlled clinical trials of children, adolescents and adults meeting DSM criteria for ADHD who received VYVANSE.

Table 4 presents common ADRs reported in long-term, open-label clinical trials in children, adolescents and adults meeting DSM criteria for ADHD who received VYVANSE.

Adverse Reactions Associated with Discontinuation of Treatment in ADHD Clinical Trials:

In patients aged 6 to 12 years, 8 % of VYVANSE-treated patients discontinued due to adverse reactions compared to 0 % of placebo-treated patients. The most frequently reported adverse reactions were ECG criteria for left ventricular hypertrophy, tics, vomiting, psychomotor hyperactivity, insomnia, decreased appetite and rash. Less frequently reported adverse reactions included upper abdominal pain, dry mouth, decreased weight, dizziness, somnolence, logorrhoea, chest pain, anger and hypertension.

In patients aged 13 to 17 years, 3 % of VYVANSE-treated patients discontinued due to adverse reactions compared to 1% of placebo-treated patients. The most frequently reported adverse reactions were decreased appetite (1 %), and insomnia (1 %). Less frequently reported adverse reactions included irritability, dermatillomania, mood swings, and dyspnoea.

In the controlled adult trial, 6 % of VYVANSE-treated patients discontinued due to adverse reactions compared to 2 % of placebo-treated patients. The most frequently reported adverse reactions were insomnia (2 %), tachycardia (1 %), irritability (1 %), hypertension (1 %), headache (1 %), anxiety (1 %), and dyspnoea (1 %). Less frequently reported adverse reactions included palpitations, diarrhoea, nausea, decreased appetite, dizziness, agitation, depression, paranoia and restlessness.

**Table 1: Adverse Drug Reactions Occurring in ≥2 % of Children meeting DSM criteria for ADHD who Received VYVANSE in Short-term, Parallel-group, Controlled Studies**

| | **NRP104.301 (forced dose; 4 weeks)** | | **SPD489-325 (dose optimisation; 7 weeks)** | |
|---|---|---|---|---|
| System Organ Class<br>Preferred Term | VYVANSE N=218 (n [%]) | Placebo N=72 (n [%]) | VYVANSE N=77 (n [%]) | Placebo N=79 (n [%]) |
| Gastrointestinal disorders | | | | |
| Abdominal discomfort/pain | 2 (0,9) | 2 (2,8) | 6 (7,8) | 4 (5,1) |
| Abdominal pain upper | 25 (11,5) | 4 (5,6) | 6 (7,8) | 5 (6,3) |
| Diarrhoea | 1 (0,5) | 2 (2,8) | 4 (5,2) | 1 (1,3) |
| Dry mouth | 10 (4,6) | 0 (0,0) | | |
| Nause | 13 (6,0) | 2 (2,8) | 8 (10,4) | 2 (2,5) |
| Toothache | | | 0 | 2 (2,5) |
| Vomiting | 19 (8,7) | 3 (4,2) | 3 (3,9) | 1 (1,3) |
| General disorders and administration site conditions | | | | |
| Fatigue | | | 3 (3,9) | 2 (2,5) |
| Irritability | 21 (9,6) | 0 | 3 (3,9) | 0 |
| Pyrexia | 5 (2,3) | 1 (1,4) | 3 (3.9) | 0 |
| Investigations | | | | |
| ECG QT prolongation | | | 2 (2.6) | 1 (1,3) |
| Weight decreased | 19 (8,7) | 2 (2,8) | 10 (13,0) | 0 |
| Infections and Infestations | | | | |
| Nasopharyngitis | | | 4 (5,2) | 5 (6,3) |
| Rhinitis | | | 2 (2,60) | 2 (2,5) |
| Upper respiratory tract infections | | | 1 (1,3) | 2 (2,5) |
| Metabolism and nutrition disorders | | | | |

| | | | | |
|---|---|---|---|---|
| Anorexia | 16 (7,3) | 1 (1,4) | 8 (10,4) | 2 (2,5) |
| Decreased appetite | 88 (40,4) | 3 (4,2) | 19 (24,7) | 3 (3,8) |
| Nervous system disorders | | | | |
| Dizziness | 11 (5,0) | 0 | 1 (1,3) | 1 (1,3) |
| Headache | 26 (11,9) | 7 (9,7) | 9 (11,7) | 12 (15,2) |
| Somnolence | 5 (2,3) | 1 (1,4) | | |
| Psychiatric disorders | | | | |
| Affect lability | 9 (4,1) | 0 | | |
| Aggression | 3 (1,4) | 0 | 4 (5,2) | 1 (1,3) |
| Initial insomnia | 8 (3,7) | 0 | 2 (2,6) | 1 (1,3) |
| Insomnia | 42 (19,3) | 2 (2,8) | 12 (15,6) | 0 |
| Sleep disorders | | | 4 (5,2) | 1 (1,3) |
| Restlessness | | | 1 (1,3) | 2 (2,5) |
| Tic | 5 (2,3) | 0 | 2 (2,5) | 2 (2,5) |
| Respiratory, Thoracic, Mediastinal disorders | | | | |
| Cough | 3 (1,4) | 4 (5,6) | 3 (3,9) | 0 |
| Nasal congestion | 3 (1,4) | 4 (5,6) | | |
| Oropharyngeal pain | 7 (3,2) | 2 (2,8) | | |
| Skin and subcutaneous disorders | | | | |
| Erythema | | | 1 (1,3) | 2 (2,5) |
| Rash | 6 (2,8) | 0 | | |

Note: Subjects are only counted once within each treatment group and by system organ class and preferred term. Percentages are based on the number of subjects in the Safety Population for each treatment group

**Table 2: Adverse Drug Reactions Occurring in ≥2 % of Adolescents meeting DSM criteria for ADHD who Received VYVANSE or Active Treatment in Short-term, Parallel-group, Controlled Studies**

| | **SPD489-305 (forced dose; 4 weeks)** | | **SPD489-325 (dose optimisation; 7 weeks)** | |
|---|---|---|---|---|
| | VYVANSE | Placebo | VYVANSE | Placebo |
| System Organ Class | N=233 | N=77 | N=34 | N=31 |
| Preferred Term | (n [%]) | (n [%]) | (n [%]) | (n [%]) |
| Gastrointestinal disorders | | | | |
| Abdominal discomfort/pain | 4 (1,7) | 3 (3,9) | 0 | 2 (6,5) |
| Abdominal pain upper | 2 (0,9) | 3 (3,9) | 2 (5,9) | 1 (3,2) |
| Dry mouth | 10 (4,3) | 1 (1.3) | 2 (5,9) | 0 |
| Diarrhoea | 6 (2,6) | 2 (2,6) | 1 (2,9) | |
| Nausea | 9 (3,9) | 2 (2,6) | 4 (11.8) | 1 (3,2) |
| Toothache | | | 1 (2,9) | 0 |
| Vomiting | 3 (1,3) | 4 (5,2) | 1 (2,9) | 0 |
| General disorders and administration site conditions | | | | |
| Chills | | | 1 (2,9) | 0 |
| Peripheral coldness | | | 1 (2,9) | 0 |

| | | | | |
|---|---|---|---|---|
| Thirst | | | 1 (2,9) | 1 (3,2) |
| Fatigue | 10 (4,3) | 2 (2,6) | 2 (5,9) | 1 (3,2) |
| Irritability | 16 (6,9) | 3 (3,9) | 1 (2,9) | 0 |
| Infections and Infestations | | | | |
| Gastroenteritis | | | 3.(8,8) | 0 |
| Nasopharyngitis | 7 (3,0) | 1 (1,3) | 4 (11,8) | 3 (9,7) |
| Sinusitis | 1 (0,4) | 3 (3,9) | 0 | 2 (6,5) |
| Upper respiratory tract infection | 10 (4,3) | 6 (7,8) | 2(5,9) | 0 |
| Investigations | | | | |
| Blood Pressure Increase | | | 0 | 1 (3,2) |
| ECG QT Prolongation | | | 1 (2,9) | 0 |
| Weight decreased | 22 (9,4) | 0 | 5 (14,7) | 0 |
| Metabolism and nutrition disorders | | | | |
| Anorexia | 4 (1,7) | 0 | 4 (11,8) | 0 |
| Decreased appetite | 83 (35,6) | 2 (2,6) | 9 (26,5) | 0 |
| Polydipsia | | | 1 (2,9) | 0 |
| Musculoskeletal and connective tissue disorders | | | | |
| Musculoskeletal chest pain | | | 1 (2,9) | 1 (3,2) |
| Neck pain | | | 1 (2,9) | 1 (3,2) |
| Cardiac disorders | | | | |
| Angina | | | 1 (2,9) | 0 |
| Tachycardia | | | 1 (2,9) | 1 (3,2) |
| Palpitations | 5 (2,1) | 1 (1,3) | 1 (2,9) | 1 (3,2) |
| Nervous system disorders | | | | |
| Dizziness | 10 (4,3) | 3 (3,9) | 3 (8,8) | 0 |
| Headache | 34 (14,6) | 10 (13,0) | 7 (20,6) | 10 (32,3) |
| Migraine | | | 2 (5,9) | 0 |
| Somnolence | 1 (0,4) | 2 (2,6) | | |
| Poor quality sleep | | | 1 (2,9) | 0 |
| Tremor | | | 1 (2,9) | 1 (3,2) |
| Psychiatric disorders | | | | |
| Initial insomnia | 6 (2,6) | 0 | 1 (2,9) | 0 |
| Insomnia | 26 (11,2) | 3 (3,9) | 4 (11,8) | 0 |
| Euphoric mood | | | 1 (2,9) | 0 |
| Sleep disorder | | | 2 (5,9) | 0 |
| Respiratory, Thoracic and mediastinal disorders | | | | |
| Allergic Bronchitis | | | 1 (2,9) | 0 |
| Dyspnoea | | | 1 (2,9) | 1 (3,2) |
| Skin and subcutaneous skin disorders | | | | |
| Pruritus | | | 1 (2,9) | |
| Vascular disorders | | | | |

| | | |
|---|---|---|
| Flushing | 1 (2,9) | 0 |

Note: Subjects are only counted once within each treatment group and by system organ class and preferred term. Percentages are based on the number of subjects in the Safety Population for the treatment group.

**Table 3: Adverse Drug Reactions Occurring in ≥2 % of Adults meeting DSM criteria for ADHD who Received VYVANSE in Short-term, Parallel-group, Controlled Studies**

| System Organ Class<br>Preferred Term | VYVANSE<br>N=493<br>(n [%]) | Placebo<br>N=202<br>(n [%]) |
|---|---|---|
| Gastrointestinal disorders | | |
| Upper abdominal pain | 11 (2,2) | 2 (1,0) |
| Decreased appetite | 122 (24,7) | 6 (3,0) |
| Dry mouth | 113 (22,9) | 8 (4,0) |
| Diarrhoea | 29 (5,9) | 2 (1,0) |
| Nausea | 26 (5,3) | 5 (2,5) |
| Nervous system disorders | | |
| Dizziness | 13 (2,6) | 4 (2,0) |
| Headache | 100 (20,3) | 13 (6,4) |
| General disorders and administration site conditions | | |
| Irritability | 31 (6,3) | 7 (3,5) |
| Fatigue | 25 (5,1) | 7 (3,5) |
| Feeling jittery | 25 (5,1) | 0 |
| Infections and Infestations | | |
| Nasopharyngitis | 12 (2,4) | 5 (2,5) |
| Upper respiratory tract infections | 29 (5,9) | 4 (2,0) |
| Investigations | | |
| Blood pressure increase | 11 (2,2) | 1 (0,5) |
| Weight decreased | 19 (3,9) | 0 |
| Metabolism and nutritional disorders | | |
| Decreased appetite | 143 (29,0) | 6 (3,0) |
| Respiratory Thoracic and mediastinal disorders | | |
| Dyspnoea | 12 (2,4) | 0 |
| Psychiatric disorders | | |
| Insomnia | 79 (16,0) | 12 (5,9) |
| Agitation | 12 (2,4) | 1 (0,5) |
| Initial insomnia | 26 (5,3) | 6 (3,0) |
| Middle insomnia | 13 (2,6) | 0 (0,5) |
| Anxiety | 25 (5,1) | 0 |
| Skin and subcutaneous tissue disorders | | |
| Hyperhidrosis | 14 (2,8) | 0 |

Note: Subjects were counted once within each preferred term and treatment group. Percentages are based on the number of subjects in the Safety Population for each treatment group. Adverse events were coded using Medical Dictionary for Regulatory Activities Version 11.1.

**Table 4: Adverse Drug Reactions Occurring in ≥ 2 % of Children, Adolescents or Adults meeting DSM criteria for ADHD who Received VYVANSE in Long-term, Open-label Studies**

| System Organ Class<br>Preferred Term | **NRP104.302 (children)**<br>(52 weeks open-label VYVANSE)<br>N=270<br>(n [%]) | **SPD489-306 (adolescents)**<br>(52 weeks open-label VYVANSE)<br>N=265<br>(n [%]) | **NRP104.304 (adults)**<br>(52 weeks open-label VYVANSE)<br>N=349<br>(n [%]) |
|---|---|---|---|
| Gastrointestinal disorders | | | |
| Abdominal discomfort | 7 (2,6) | 5 (1,9) | |
| Abdominal pain upper | 29 (10,7) | 8 (3,0) | |
| Constipation | | | 10 (2,9) |
| Diarrhoea | 9 (3,3) | 6 (2,3) | 11 (3,2) |
| Dyspepsia | | | 8 (2,3) |
| Dry mouth | 5 (1,9) | 15 (5,7) | 58 (16,6) |
| Nausea | | | 16 (4,6) |
| Toothache | 6 (2,2) | 9 (3,4) | |
| Vomiting | 23 (8,5) | 7 (2,6) | |
| General disorders and administration site conditions | | | |
| Fatigue | 7 (2,6) | 6 (2,3) | 15 (4,3) |
| Feeling Jittery | | | 11 (3,2) |
| Pyrexia | 13 (4,8) | 10 (3,8) | |
| Irritability | 27 (10,0) | 33 (12.5) | 39 (11,2) |
| Infections and Infestations | | | |
| Bronchitis | 2 (0,7) | 9 (3,4) | |
| Ear Infection | 7 (2,6) | 2 (0,8) | |
| Gastroenteritis | 5 (1,9) | 9 (3,4) | 14 (4,0) |
| Gastroenteritis viral | 11(4,1) | 6 (2,3) | 13 (3,7) |
| Influenza | 16 (5,9) | 18 (6,8) | 16 (3,6) |
| Nasopharyngitis | 25 (9,3) | 19 (7,2) | 26 (7,4) |
| Pharyngitis Streptococcal | 8 (3,0) | 6 (2,3) | |
| Sinusitis | | | 23 (6,6) |
| Upper respiratory tract infection | 29 (10,7) | 58 (21,9) | 76 (21,8) |
| Investigations | | | |
| Blood pressure increase | | | 8 (2,3) |
| Heart rate increased | 1 (0,4) | 6 (2,3) | 10 (2,9) |
| Weight decreased | 48 (17,8) | 45(17,0) | 21 (6,0) |

| | | | |
|---|---|---|---|
| Metabolism and nutrition disorders | | | |
| Anorexia | | | 12 (3,4) |
| Decreased appetite | 92 (34,1) | 61 (23,0) | 50 (14,3) |
| Musculoskeletal and connective tissue disorders | | | 68 (22,6) |
| Nervous system disorders | | | |
| Dizziness | 4 (1,5) | 14 (5,3) | 15 (4,3) |
| Headache | 48 (17,8) | 55 (20,8) | 60 (17,2) |
| Psychiatric disorders | | | |
| Affect lability | 17 (6,3) | 5 (1,9) | |
| Anxiety | 3 (1,1) | 3 (1,1) | 29 (8,3) |
| Insomnia | 48 (17,8) | 32 (12,1) | 68 (19,5) |
| Initial insomnia | 8 (3,0) | 6 (2,3) | 17 (4,9) |
| Mood Swings | 9 (3,3) | 5 (1,9) | |
| Tearfulness | 10 (3,7) | 0 | |
| Respiratory, Thoracic and Mediastinal disorders | | | |
| Cough | 19 (7,0) | 9 (3,4) | 17 (4,9) |
| Oropharyngeal pain | 9 (3,3) | 8 (3,0) | 15 (4,3) |
| Sinus congestion | | | 12 (3,4) |
| Skin and subcutaneous tissue disorders | | | 40 (11,5) |
| Note: Subjects are only counted once within each study and by system organ class and preferred term. Percentages are based on the number of subjects in each study. | | | |

The following definitions apply to the frequency terminology used:

Incidence Categories:

| | |
|---|---|
| Very common | (≥10 %) |
| Common | (≥1 % and <10 %) |
| Uncommon | (≥0,1 % and <1 %) |
| Rare | (≥0,01 % and <0,1 %) |
| Very rare | (<0,01 %) |
| Incidence not known | (cannot be estimated from the available data) |

Additional Adverse Reactions reported with VYVANSE in Clinical Trials

**Table 5: Additional Adverse Reactions reported with VYVANSE in Clinical Trials**

| System/Organ Class | Adverse Drug Reaction | ADHD | | |
|---|---|---|---|---|
| | | Adults | Adolescents | Children |
| Immune System Disorders | *Anaphylactic reaction | Frequency not known | Frequency not known | Frequency not known |
| | Hypersensitivity | Uncommon | Uncommon | Uncommon |
| Psychiatric Disorders | *Insomnia | Very common | Very common | Very common |
| | Agitation | Common | Uncommon | Uncommon |
| | Anxiety | Common | Common | Uncommon |
| | Logorrhoea | Uncommon | Uncommon | Uncommon |
| | Libido decreased | Common | Not reported | Not applicable |
| | Depression | Uncommon | Common | Uncommon |
| | Tic | Uncommon | Uncommon | Common |
| | Affect lability | Common | Uncommon | Common |
| | Dysphoria | Uncommon | Uncommon | Uncommon |
| | Euphoria | Uncommon | Uncommon | Frequency not known |
| | Psychomotor hyperactivity | Common | Uncommon | Uncommon |
| | Bruxism | Common | Uncommon | Uncommon |
| | Dermatillomania | Uncommon | Uncommon | Uncommon |
| | *Psychotic episodes | Frequency not known | Frequency not known | Frequency not known |
| | Mania | Uncommon | Uncommon | Uncommon |
| | Hallucination | Frequency not known | Uncommon | Uncommon |
| | Aggression | Frequency not known | Uncommon | Common |
| Nervous System Disorders | Headache | Very common | Very common | Very common |
| | Dizziness | Common | Common | Common |

| | | | | |
|---|---|---|---|---|
| | Restlessness | Common | Common | Uncommon |
| | Tremor | Common | Common | Uncommon |
| | Somnolence | Uncommon | Common | Common |
| | *Seizure | Frequency not known | Frequency not known | Frequency not known |
| | Dyskinesia | Uncommon | Uncommon | Uncommon |
| | *Dysgeusia | Uncommon | Uncommon | Uncommon |
| | Syncope | Uncommon | Uncommon | Uncommon |
| Eye Disorders | *Vision blurred | Uncommon | Frequency not known | Uncommon |
| | *Mydriasis | Frequency not known | Uncommon | Uncommon |
| Cardiac Disorders | Tachycardia | Common | Common | Common |
| | Palpitation | Common | Common | Uncommon |
| | *QTc prolongation | Frequency not known | Frequency not known | Frequency not known |
| | *Cardiomyopathy | Frequency not known | Uncommon | Frequency not known |
| Vascular Disorders | *Raynaud's phenomenon | Frequency not known | Frequency not known | Uncommon |
| Respiratory, Thoracic and Mediastinal Disorders | Dyspnoea | Common | Common | Uncommon |
| Gastrointestinal Disorders | Dry mouth | Very common | Common | Common |
| | Diarrhoea | Common | Common | Common |
| | Constipation | Common | Uncommon | Common |
| | Upper abdominal pain | Common | Common | Very common |
| | Nausea | Common | Common | Common |
| | Vomiting | Uncommon | Common | Common |
| | Hyperhidrosis | Common | Uncommon | Uncommon |
| | Urticaria | Uncommon | Uncommon | Uncommon |

| | | | | |
|---|---|---|---|---|
| Skin and Subcutaneous Tissue Disorders | Rash | Uncommon | Uncommon | Common |
| | *Angioedema | Frequency not known | Frequency not known | Frequency not known |
| | *Stevens-Johnson Syndrome | Frequency not known | Frequency not known | Frequency not known |
| General Disorders and Administration Site Conditions | *Chest Pain | Common | Uncommon | Uncommon |
| | Irritability | Common | Common | Common |
| | Fatigue | Common | Common | Common |
| | Feeling jittery | Common | Common | Uncommon |
| | Pyrexia | Uncommon | Common | Common |
| Investigations | Blood pressure increased | Common | Uncommon | Uncommon |
| | Weight decreased | Common | Very Common | Very Common |
| Reproductive System and Breast Disorders | Erectile dysfunction | Common | Uncommon | Not applicable |
| Hepatobiliary | *Eosinophilic Hepatitis | Frequency not known | Frequency not known | Frequency not known |

*The following Adverse Drug reactions have been identified during post marketing surveillance

**Suppression of growth in paediatric patients with ADHD**

**Weight**

Weight change compared to placebo has been evaluated in 4-week trials for children (age 6-12) and adolescents (age 13-17). Higher doses were associated with greater weight loss. In children, mean weight loss from baseline to endpoint was -0,39, -0,84, and -1,12 kg, for patients assigned to receive 30 mg, 50 mg, and 70 mg of VYVANSE respectively, compared to a 0,46 kg weight gain for patients receiving placebo. In adolescents, mean weight change from baseline to endpoint was -1,24, -1,94, and -2,16 kg, , for patients assigned to receive 30 mg, 50 mg, and 70 mg of VYVANSE respectively, compared to a 0,9 kg weight gain for patients receiving placebo.

In children and adolescents who received VYVANSE over 12 months, careful monitoring of weight suggested that consistent medication (i.e., treatment for 7 days per week throughout the year) resulted in a slowing of growth as measured by body weight. In children, the average weight percentiles at baseline (n=271) and 12 months (n=146), were 60,9 and 47,2,

respectively. The age- and sex-normalised mean change from baseline in percentile over 1 year was -13,4. In adolescents, the average weight percentiles at baseline (n=265) and 12 months (n=156), were 66,0 and 61,5, respectively. The age- and sex-normalised mean change from baseline in percentile over 1 year was -6,5. (See Section 4.4 Special Warnings and Precautions For Use.)

In children and adolescents (aged 6-17) who received VYVANSE over two years, careful monitoring of weight suggested that consistent medication (i.e., treatment for 7 days per week throughout the two years) resulted in a slowing of growth as measured by body weight. In children and adolescents, the average weight percentiles and standard deviations (SD) at baseline (N=314) and 24 months (week 104, N=189), were 65.4 (SD 27,11) and 48,2 (SD 29,94), respectively. The age- and sex-normalized mean change from baseline in percentile over 2 years was -16,9 (SD 17,33).

**Long term growth**

Long term controlled height and weight data with use of VYVANSE are not available. In a long-term study, careful follow-up of weight and height in children ages 7 to 10 years who were randomised 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 children over 36 months (to the ages of 10 to 13 years) (total of all subgroups n=370), suggests that consistently medicated children (i.e., treatment for 7 days per week throughout the year) have a 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.

**Reporting of suspected adverse reactions**

Reporting suspected adverse reactions after authorisation of VYVANSE is important. It allows continued monitoring of the benefit/risk balance of the medicine. Health care providers are asked to report any suspected adverse reactions to SAHPRA via the “6.04 Adverse Drug Reactions Reporting Form”, found online under SAHPRA’s publications: https://www.sahpra.org.za/Publications/Index/8

## 4.9 Overdose

Manifestations of acute overdosage with amfetamines include restlessness, tremor, hyperreflexia, rapid respiration, confusion, aggression, hallucinations, panic states, hyperpyrexia, rhabdomyolysis and other features of serotonin syndrome. Fatigue and

depression usually follow the central nervous system stimulation. Cardiovascular effects include dysrhythmias, hypertension or hypotension, and circulatory collapse. Gastrointestinal symptoms include nausea, vomiting, diarrhoea, and abdominal cramps. Fatal poisoning is usually preceded by convulsions and coma.

There is no specific antidote to amfetamine overdose. Management of acute amfetamine intoxication is largely symptomatic and supportive which includes administration of activated charcoal (during the first hour of intoxication if the patient is conscious), administration of a cathartic and sedation.

Lisdexamfetamine and dexamfetamine are not dialysable.

In case of amfetamine overdose, consult a poison control centre for guidance or treat as clinically indicated. The prolonged release of VYVANSE in the body should be considered when treating patients with overdose.

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

**Pharmacological Class:** A 1.6 Other central nervous system stimulants
Pharmacotherapeutic Group
Centrally Acting Sympathomimetics, ATC Code: N06BA12

**General**
Lisdexamfetamine is a pharmacologically inactive pro-drug of dexamfetamine, which is a central nervous system stimulant.

**Mechanism of action**
After oral administration, lisdexamfetamine is rapidly absorbed from the gastrointestinal tract and hydrolysed primarily in whole blood to dexamfetamine, which is responsible for the medicine activity. Amfetamines are non-catecholamine sympathomimetic amines with CNS stimulant activity. The mode of therapeutic action of amfetamine in Attention Deficit Hyperactivity Disorder (ADHD) is not fully established, however it is thought to be due to its ability to block the reuptake of norepinephrine (noradrenaline) and dopamine into the presynaptic neuron and increase the release of these monoamines into the extraneuronal space. The parent active

ingredient, lisdexamfetamine, does not bind to the sites responsible for the reuptake of noradrenaline and dopamine *in vitro.*

**Clinical trials**

The efficacy of lisdexamfetamine dimesylate in the treatment of ADHD has been demonstrated in four controlled trials in adults, three controlled studies in adolescents aged 13-17 years, three controlled trials in children and adolescents (6 to 17 years) and three controlled studies in children aged 6 to 12 years. The patients in all these studies met DSM criteria for ADHD.

In clinical studies conducted in children and adults, the effects of VYVANSE were on-going at 13 hours after dosing in children and at 14 hours in adults when the product was taken once daily in the morning (data presented below).

In dose optimisation studies, the mean (range) daily dose of VYVANSE tended to be slightly lower in studies in children 47,4 mg (range [44,3-50,5 mg]) than in adolescents 56,15 mg (range [53,5-58,8 mg]) or adults 54,55 mg (range [52,3-56,8 mg]). Dose optimisation to achieve the best benefit harm balance in children 6 – 12 years of age cannot be done with the available formulations of VYVANSE.

**Adolescents aged from 13 to 17 years with ADHD**

A double-blind, randomised, placebo-controlled, parallel-group study was conducted in adolescents aged 13 to 17 (N=314) who met DSM criteria for ADHD. In this four-week study, patients were randomised in a 1:1:1:1 ratio to a daily morning dose of VYVANSE (30, 50 or 70 mg/day) or placebo for a double-blind stepwise forced dose titration (3 weeks) followed by a 1-week Dose Maintenance Period. All subjects receiving VYVANSE were initiated on 30 mg for the first week of treatment. Subjects assigned to the 50 and 70 mg dose groups were titrated by 20 mg per week until they achieved their assigned dose. Significant improvements in ADHD symptoms, based upon investigator ratings on the ADHD Rating Scale (ADHD-RS), were observed at endpoint for all VYVANSE doses compared to placebo. ADHD-RS results for Study SPD489-305 are shown in the following table:

**ADHD-RS Total Score at Endpoint (Adolescents; Study SPD489-305; Full Analysis Set)**

| | Baseline | Change from Baseline | | | | ≥50 % Response [a] | | |
|---|---|---|---|---|---|---|---|---|
| Treatment | Mean (SD) | n | LS Mean (SE) Change | LS Means Diff. | 95% CI | p-value[b] | n Percent | -value[c] |
| Placebo | 77 38,5 (7,11) | 76 | -12,8 (1,25) | | | | 77 33,8 | |
| VYVANSE 30mg | 78 38,3 (6,71) | 76 | -18,3 (1,25) | -5,5 | (-9,7; -1,3) | 0,0056 | 78 50,0 | 0,041 |
| VYVANSE 50mg | 76 37,3 (6,33) | 72 | -21,1 (1,28) | -8,3 | (-12,5; -4,1) | <0,0001 | 77 59,7 | 0,001 |
| VYVANSE 70mg | 78 37,0 (7,30) | 75 | -20,7 (1,25) | -7,9 | (-12,1; -3,8) | <0,0001 | 78 56,4 | 0,005 |

[a] Defined as a ≥50 % decrease from baseline in ADHD-RS Total Score at endpoint

[b] p-value is adjusted based on Dunnett's multiple comparison procedure for comparing the active doses to placebo.

[c] p-value is based on Cochran-Mantel-Haenszel test comparing each active dose to placebo controlling for pooled site

Note: Endpoint is the last post-randomisation treatment week for which a valid ADHD-RS-IV Total Score is obtained. Response is defined as a percentage reduction from baseline in the ADHD-RS-IV Total Score of ≥50 %

Full Analysis Set=full analysis set (all subjects who took at least 1 dose of investigational product and who had a valid baseline and at least 1 post-baseline ADHD-RS total score); SE=standard error.

**Maintenance of Efficacy Study:**

A double-blind, placebo-controlled, randomised withdrawal study was conducted in children and adolescents aged 6 to 17 years (N=276) who met the diagnosis of ADHD (DSM criteria). A total of 276 patients were enrolled into the study, 236 patients participated in the preceding study SPD489-325 and 40 subjects directly enrolled. Subjects were treated with open-label VYVANSE for an extended period (at least 26 weeks) prior to being assessed for entry into the randomised withdrawal period. Eligible patients had to demonstrate treatment response as defined by CGI-S <3 and total score on the ADHD-RS ≤22. Of patients that maintained open label treatment response, 157 were randomised to on-going 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. Maintenance of efficacy was demonstrated based on the significantly lower proportion of treatment failure among VYVANSE subjects (15,8 %) compared to placebo (67,5 %) at endpoint of the randomised withdrawal

period (p<0,001). The endpoint measurement was defined as the last post-randomisation treatment week at which a valid ADHD-RS total score and CGI-S were observed. Treatment failure was defined as a ≥50 % increase (worsening) in the ADHD-RS total score and a ≥2-point increase in the CGI-S score compared to scores at entry into the double-blind randomised withdrawal phase. For the majority of subjects (70,3 %) who were treatment failures ADHD symptoms worsened at or before the week 2 visit following randomisation.

**Adults with ADHD**

A double-blind, randomised, placebo-controlled, parallel-group study was conducted in adults (N=420) who met DSM criteria for ADHD. In this four-week study, patients were randomised to fixed dose treatment groups receiving final doses of 30, 50, or 70 mg of VYVANSE or placebo. All subjects receiving VYVANSE were initiated on 30 mg for the first week of treatment. Subjects assigned to the 50 and 70 mg dose groups were titrated by 20 mg per week until they achieved their assigned dose. Significant improvements in ADHD symptoms, based upon investigator ratings on the ADHD Rating Scale (ADHD-RS), were observed at endpoint for all VYVANSE doses compared to placebo. ADHD-RS results for Study NRP104.303 are shown in the following table:

**ADHD-RS Total Score at Endpoint (Adults; Study NRP104.303; Full Analysis Set)**

| | **Baseline** | | **Change from Baseline** | | | | **≥50 % Response[a]** | | |
|---|---|---|---|---|---|---|---|---|---|
| Treatment | n | Mean (SD) | N | LS Mean (SE) Change | LS Means Diff. | 95 % CI | p-value[b] | n | Percent | p-value[c] |
| Placebo | 62 | 39,4 (6,42) | 62 | -8,2 (1,43) | | | | 62 | 12,9 | |
| VYVANSE 30mg | 115 | 40,5 (6,21) | 115 | -16,2 (1,06) | -8,04 | (-12,14; -3,95) | <0,0001 | 119 | 36,1 | 0,002 |
| VYVANSE 50mg | 117 | 40,8 (73,0) | 117 | -17,4 (1,05) | -9,16 | (-13,25; -5,08) | <0,0001 | 117 | 40,2 | <0,001 |
| VYVANSE 70mg | 120 | 41,0 (6,02) | 120 | -18,6 (1,03) | -10,41 | (-14,49; -6,33) | <0,0001 | 122 | 44,3 | <0,001 |

[a] Defined as a ≥50 % decrease from baseline in ADHD-RS Total Score at endpoint

[b] p-value is adjusted based on Dunnett's multiple comparison procedure for comparing the active doses to placebo.

[c] p-value is based on Cochran-Mantel-Haenszel test comparing each active dose to placebo controlling for pooled site

Note: Endpoint is the last post-randomisation treatment week for which a valid ADHD-RS-IV Total Score is obtained.

Note: Response is defined as a percentage reduction from baseline in the ADHD-RS-IV Total Score of ≥50 %
Full Analysis Set=full analysis set (all subjects who took at least 1 dose of investigational product and who had a valid baseline and at least 1 post-baseline ADHD-RS total score); SE=standard error.

The second study was a multi-centre, randomised, double-blind, placebo-controlled, crossover design, modified analog classroom study of VYVANSE to simulate a workplace environment in 142 adults who met DSM criteria for ADHD. There was a 4-week open-label, dose optimisation phase with VYVANSE (30, 50, or 70 mg/day in the morning). Subjects were then randomised to one of two treatment sequences: 1) VYVANSE (optimised 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). The PERMP is a skill-adjusted mathematics test that measures attention in ADHD. 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. In this study most subjects (>80 %) required a dose greater than 30 mg. The majority of subjects (~50 %) had a final dose of 50 mg.

**Maintenance of Efficacy Study:**

A double-blind, placebo-controlled, randomised withdrawal design study was conducted in adults aged 18 to 55 (N=123) who met DSM criteria for ADHD. At study entry, subjects must have had documentation of treatment with VYVANSE for a minimum of 6 months and had to demonstrate treatment response as defined by CGI-S ≤3 and Total Score on the ADHD-RS with adult prompts <22. ADHD-RS with adult prompts Total Score is a measure of core symptoms of ADHD. Subjects that maintained treatment response at week 3 of open label treatment phase (N=116) were eligible to enter the 6 week double-blind randomised withdrawal phase, and received their entry dose of VYVANSE (N=56) or placebo (N=60). Maintenance of efficacy for subjects treated with VYVANSE was demonstrated by the significantly lower proportion of treatment failure (<9 %) compared to subjects receiving placebo (75 %) in the double-blind randomised withdrawal phase (p<0,0001). Treatment failure was defined as a ≥50 % increase in the ADHD-RS with adult prompts Total Score and ≥2-point increase in the CGI-S score compared to scores at entry into the double-blind randomised withdrawal phase. For subjects

receiving VYVANSE, the median and mean duration in the double-blind randomised withdrawal phase was 42,0 and 39,1 days, respectively. For subjects receiving placebo, the median and mean duration in the double-blind randomised withdrawal phase was 13,0 and 18,2 days, respectively. The difference in duration between the two treatment groups was because the majority of treatment failures occurred in the first 14 days after subjects were switched from open-label SPD489 treatment to placebo.

**Abuse liability studies**

In a human abuse liability study, when equivalent oral doses of 100 mg lisdexamfetamine dimesylate and 40 mg immediate-release dexamfetamine sulphate were administered to individuals with a history of drug abuse, lisdexamfetamine dimesylate 100 mg produced subjective responses on a scale of “Drug Liking Effects” (primary endpoint) that were significantly less than dexamfetamine immediate-release 40 mg. However, oral administration of 150 mg lisdexamfetamine dimesylate produced increases in positive subjective responses on this scale that were comparable to the positive subjective responses produced by 40 mg of oral immediate-release dexamfetamine 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”, “Amfetamine Effects”, and "Benzedrine Effects" that were greater than placebo but less than those produced by an equivalent dose (20 mg) of intravenous dexamfetamine.

## 5.2 Pharmacokinetic properties

**Absorption**

After oral administration, lisdexamfetamine is rapidly absorbed from the gastrointestinal tract, thought to be mediated by the high capacity peptide transporter-1 (PEPT-1).

In 18 paediatric patients (6–12 years) with ADHD, the Tmax of dexamfetamine was approximately 3,5 h following single-dose oral administration of lisdexamfetamine dimesilate either 30 mg, 50 mg, or 70 mg after an 8-hour overnight fast. The Tmax of lisdexamfetamine dimesilate was approximately 1 h. Linear pharmacokinetics of dexamfetamine after single-dose oral administration of lisdexamfetamine dimesilate was established over the dose range of 30 mg to 70 mg in children aged 6 to 12 years and over the dose range of 50 mg to 250 mg in adults. Dexamfetamine pharmacokinetic parameters following administration of lisdexamfetamine in adults exhibited low inter-subject (<25 %) and intra-subject (<8 %) variability. Safety and efficacy have not been studied above the maximum recommended dose of 70 mg.

Food (a high fat meal or soft food such as yogurt) or orange juice does not affect the AUC and Cmax of dexamfetamine in healthy adults after single-dose oral administration of 70 mg of VYVANSE capsules. Food delays Tmax by approximately 1 hour (from 3,8 h at fasted state to 4,7 h after a high fat meal or to 4,2 h after soft food such as yogurt).

After an 8-hour fast, the AUC for dexamfetamine, following oral administration of lisdexamfetamine dimesilate in solution, and as intact capsules were equivalent.

Weight/Dose normalised AUC and Cmax for dexamfetamine were 22 % and 12 % lower, respectively, in adult females than in males on day 7 following a 70 mg/day dose of lisdexamfetamine for 7 days. Weight/Dose normalised AUC and Cmax values were the same in girls and boys following single doses of 30-70 mg.

**Distribution**

There is no accumulation of dexamfetamine AUC at steady state in healthy adults and no accumulation of lisdexamfetamine dimesilate after once-daily dosing for 7 consecutive days.

**Metabolism**

Lisdexamfetamine is converted to dexamfetamine and L-lysine, not by cytochrome P450 enzymes metabolism, but by metabolism in blood primarily due to the hydrolytic activity of red blood cells. Red blood cells have a high capacity for metabolism of lisdexamfetamine as *in vitro* data demonstrated substantial hydrolysis occurs even at low haematocrit levels.

Amfetamine is reported to be oxidised at the 4 position of the benzene ring to form 4-hydroxyamfetamine, or on the side chain α or β carbons to form alpha-hydroxy-amfetamine or norepinephrine (noradrenaline), respectively. Norepinephrine (noradrenaline) and 4-hydroxy-amfetamine are both active and each is subsequently oxidised to form 4-hydroxy-norepinephrine (noradrenaline). Alpha-hydroxy-amfetamine undergoes deamination to form phenylacetone, which ultimately forms benzoic acid and its glucuronide and the glycine conjugate hippuric acid. Although the enzymes involved in amfetamine metabolism have not been clearly defined, CYP2D6 is known to be involved with formation of 4-hydroxy-amfetamine.

**Excretion**

Following the oral administration of a 70 mg dose of radiolabelled lisdexamfetamine dimesilate to 6 healthy subjects, approximately 96 % of the oral dose radioactivity was recovered in the urine and only 0,3 % recovered in the faeces over a period of 120 hours. Of the radioactivity recovered in the urine, 42 % of the dose was related to amfetamine, 25 % to hippuric acid, and 2 % to intact lisdexamfetamine. 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 1 hour in studies of lisdexamfetamine dimesilate in volunteers.

**Special populations**

**Age**

The pharmacokinetics of dexamfetamine, as evaluated by clearance, is similar in paediatric (aged 6 to 12) and adolescent (aged 13 to 17) ADHD patients, and healthy adult volunteers after correcting for body weight. Following administration of lisdexamfetamine dimesilate in a study of 47 subjects aged 55 years of age or older, amfetamine clearance was approximately 0,7 L/h/kg for subjects 55-74 years of age and 0,55 L/h/kg for subjects ≥75 years of age. This is slightly reduced compared to younger adults (approximately 1 L/h/kg for subjects 18-45 years of age).

**Sex**

Following administration of lisdexamfetamine dimesilate, systemic exposure to dexamfetamine is similar for men and women given the same mg/kg dose.

**Race**

Formal pharmacokinetic studies for race have not been conducted.

**Renal Disease**

In a pharmacokinetic study of lisdexamfetamine in subjects with normal and impaired renal function dexamfetamine clearance was reduced from 0,7 L/h/kg in normal subjects to 0,4 L/h/kg in subjects with severe renal impairment (GFR 15 to <30 mL/min/1,73m$^2$). See Section 4.4 Special Warnings and Precautions For Use.

In subjects with ESRD requiring dialysis mean dexamfetamine clearance was reduced to 0,3 L/h/kg both pre- and post-dialysis. Dialysis did not significantly affect the clearance of dexamfetamine.

## 5.3 Preclinical safety data

Genotoxicity

Lisdexamfetamine dimesilate was negative (not clastogenic) in the mouse micronucleus test in vivo and was negative in the bacterial reverse mutation test and the L5178Y/TK+/- mouse lymphoma assay *in vitro*.

Carcinogenicity

Carcinogenicity studies of lisdexamfetamine dimesilate have not been performed.

No evidence of carcinogenicity was found in studies in which d-, l-amfetamine sulphate (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.

## 6 PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

VYVANSE capsules contain the following inactive ingredients:

croscarmellose sodium, magnesium stearate and microcrystalline cellulose.

The capsule shells contain gelatin, titanium dioxide (E171) (all strengths), erythrosine (E127) (30 mg and 70 mg), brilliant blue FCF (E133) (50 mg and 70 mg), and TekPrint SW-9008 (all strengths).

### 6.2 Incompatibilities

Incompatibilities were either not assessed or not identified as part of the registration of this medicine.

For interactions, please refer to Section 4.5 Interaction with Other Medicines and Other Forms of Interaction.

### 6.3 Shelf life

30 mg, 50 mg, 70 mg: 36 months from date of manufacture.

### 6.4 Special precautions for storage

Store at or below 25 ºC.

### 6.5 Nature and contents of container

Container type

VYVANSE capsules are packed in high density polyethylene (HDPE) bottles with polypropylene child resistant (PP CR) cap with a foil inner seal, inside a cardboard carton.

Pack size

30 capsules

### 6.6 Special precautions for disposal of a used medicine or waste materials derived from such medicine and other handling of the product

Any unused medicine or waste material should be disposed of by taking to your local pharmacy.

### 6.7 Web based educational tools for Prescribers

Should you require educational tools please contact

medinfoemea@takeda.com

## 7 HOLDER OF CERTIFICATE OF REGISTRATION

Takeda (Pty) Ltd

Building A, Monte Circle

64 Montecasino Boulevard

Fourways 2191,

Gauteng, South Africa

## 8 REGISTRATION NUMBER(S)

VYVANSE 30: A48/1.6/0407

VYVANSE 50: A48/1.6/0408

VYVANSE 70: A48/1.6/0409

## 9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

24 July 2020

## 10 DATE OF REVISION OF THE TEXT

14 November 2023