

ANNEX I
SUMMARY OF PRODUCT CHARACTERISTICS

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 10 mg film-coated tablets
Memantine ratiopharm 20 mg film-coated tablets

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Memantine ratiopharm 10 mg

Each film-coated tablet contains 10 mg of memantine hydrochloride equivalent to 8.31 mg memantine.

Memantine ratiopharm 20 mg

Each film-coated tablet contains 20 mg of memantine hydrochloride equivalent to 16.62 mg memantine.

Excipients with known effect:

Memantine ratiopharm 10 mg

Lactose (80 mg/film-coated tablet) and soya lecithin (0.13 mg/film-coated tablet).

Memantine ratiopharm 20 mg

Lactose (160 mg/film-coated tablet) and soya lecithin (0.26 mg/film-coated tablet).

For the full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Film-coated tablet (tablet)

Memantine ratiopharm 10 mg

White to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with "10" on the other side. The tablet can be divided into equal doses.

Memantine ratiopharm 20 mg

White to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with "20" on the other side. The tablet can be divided into equal doses.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Treatment of adult patients with moderate to severe Alzheimer's disease.

4.2 Posology and method of administration

Treatment should be initiated and supervised by a physician experienced in the diagnosis and treatment of Alzheimer's dementia.

Posology

Therapy should only be started if a caregiver is available who will regularly monitor the intake of the medicinal product by the patient. Diagnosis should be made according to current guidelines. The tolerance and dosing of memantine should be reassessed on a regular basis, preferably within three months after start of treatment. Thereafter, the clinical benefit of memantine and the patient's tolerance of treatment should be reassessed on a regular basis according to current clinical guidelines. Maintenance treatment can be continued for as long as a therapeutic benefit is favourable and the patient tolerates treatment with memantine. Discontinuation of memantine should be considered when evidence of a therapeutic effect is no longer present or if the patient does not tolerate treatment.

Adults

Dose titration

The maximum daily dose is 20 mg per day. In order to reduce the risk of undesirable effects, the maintenance dose is achieved by upward titration of 5 mg per week over the first 3 weeks as follows:

- Week 1 (day 1-7): The patient should take half a 10 mg film-coated tablet (5 mg) per day for 7 days.
- Week 2 (day 8-14): The patient should take one 10 mg film-coated tablet (10 mg) per day for 7 days.
- Week 3 (day 15-21): The patient should take one and a half 10 mg film-coated tablets (15 mg) per day for 7 days.
- From Week 4 on: The patient should take two 10 mg film-coated tablets (20 mg) or one 20 mg film-coated tablet per day.

Maintenance dose

The recommended maintenance dose is 20 mg per day.

Elderly

On the basis of the clinical studies, the recommended dose for patients over the age of 65 years is 20 mg per day (two 10 mg film-coated tablets or one 20 mg film-coated tablet once a day) as described above.

Renal impairment

In patients with mildly impaired renal function (creatinine clearance 50-80 ml/min) no dose adjustment is required. In patients with moderate renal impairment (creatinine clearance 30-49 ml/min) daily dose should be 10 mg per day. If tolerated well after at least 7 days of treatment, the dose could be increased up to 20 mg/day according to standard titration scheme. In patients with severe renal impairment (creatinine clearance 5-29 ml/min) daily dose should be 10 mg per day.

Hepatic impairment

In patients with mild or moderate hepatic impaired function (Child-Pugh A and Child-Pugh B), no dose adjustment is needed. No data on the use of memantine in patients with severe hepatic impairment are available. Administration of Memantine ratiopharm is not recommended in patients with severe hepatic impairment.

Paediatric population

No data available.

Method of administration

Memantine ratiopharm should be administered orally once a day and should be taken at the same time every day. The film-coated tablets can be taken with or without food.

4.3 Contraindications

Hypersensitivity to the active substance, peanut or soya or to any of the excipients listed in section 6.1.

4.4 Special warnings and precautions for use

Caution is recommended in patients with epilepsy, former history of convulsions or patients with predisposing factors for epilepsy.

Concomitant use of N-methyl-D-aspartate (NMDA)-antagonists such as amantadine, ketamine or dextromethorphan should be avoided. These compounds act at the same receptor system as memantine, and therefore adverse reactions (mainly central nervous system (CNS)-related) may be more frequent or more pronounced (see also section 4.5).

Some factors that may raise urine pH (see section 5.2 “Elimination”) may necessitate careful monitoring of the patient. These factors include drastic changes in diet, e.g. from a carnivore to a vegetarian diet, or a massive ingestion of alkalisating gastric buffers. Also, urine pH may be elevated by states of renal tubular acidosis (RTA) or severe infections of the urinary tract with *Proteus* bacteria.

In most clinical trials, patients with recent myocardial infarction, uncompensated congestive heart failure (NYHA III-IV), or uncontrolled hypertension were excluded. As a consequence, only limited data are available and patients with these conditions should be closely supervised.

Excipients

Memantine ratiopharm contains lactose. Patients with rare hereditary problems of galactose intolerance, the Lapp lactase deficiency or glucose-galactose malabsorption should not take this medicine.

Memantine ratiopharm contains soya lecithin, see section 4.3.

4.5 Interaction with other medicinal products and other forms of interaction

Due to the pharmacological effects and the mechanism of action of memantine the following interactions may occur:

- The mode of action suggests that the effects of L-dopa, dopaminergic agonists, and anticholinergics may be enhanced by concomitant treatment with NMDA-antagonists such as memantine. The effects of barbiturates and neuroleptics may be reduced. Concomitant administration of memantine with the antispasmodic agents, dantrolene or baclofen, can modify their effects and a dose adjustment may be necessary.
- Concomitant use of memantine and amantadine should be avoided, owing to the risk of pharmacotoxic psychosis. Both compounds are chemically related NMDA-antagonists. The same may be true for ketamine and dextromethorphan (see also section 4.4). There is one published case report on a possible risk also for the combination of memantine and phenytoin.
- Other active substances such as cimetidine, ranitidine, procainamide, quinidine, quinine and nicotine that use the same renal cationic transport system as amantadine may also possibly interact with memantine leading to a potential risk of increased plasma levels.
- There may be a possibility of reduced serum level of hydrochlorothiazide (HCT) when memantine is co-administered with HCT or any combination with HCT.
- In post-marketing experience, isolated cases with international normalized ratio (INR) increases have been reported in patients concomitantly treated with warfarin. Although no causal relationship has been established, close monitoring of prothrombin time or INR is advisable for patients concomitantly treated with oral anticoagulants.

In single-dose pharmacokinetic (PK) studies in young healthy subjects, no relevant active substance-active substance interaction of memantine with glyburide/metformin or donepezil was observed.

In a clinical study in young healthy subjects, no relevant effect of memantine on the pharmacokinetics of galantamine was observed.

Memantine did not inhibit CYP 1A2, 2A6, 2C9, 2D6, 2E1, 3A, flavin containing monooxygenase, epoxide hydrolase or sulphation *in vitro*.

4.6 Fertility, pregnancy and lactation

Pregnancy

There are no or limited amount of data from the use of memantine in pregnant women. Animal studies indicate a potential for reducing intrauterine growth at exposure levels, which are identical or slightly higher than at human exposure (see section 5.3). The potential risk for humans is unknown. Memantine should not be used during pregnancy unless clearly necessary.

Breast-feeding

It is not known whether memantine is excreted in human breast milk but, taking into consideration the lipophilicity of the substance, this probably occurs. Women taking memantine should not breast-feed.

Fertility

No adverse reactions of memantine were noted on male and female fertility.

4.7 Effects on ability to drive and use machines

Moderate to severe Alzheimer's disease usually causes impairment of driving performance and compromises the ability to use machinery. Furthermore, Memantine ratiopharm has minor to moderate influence on the ability to drive and use machines such that outpatients should be warned to take special care.

4.8 Undesirable effects

Summary of the safety profile

In clinical trials in mild to severe dementia, involving 1,784 patients treated with memantine and 1,595 patients treated with placebo, the overall incidence rate of adverse reactions with memantine did not differ from those with placebo; the adverse reactions were usually mild to moderate in severity. The most frequently occurring adverse reactions with a higher incidence in the memantine group than in the placebo group were dizziness (6.3% vs 5.6%, respectively), headache (5.2% vs 3.9%), constipation (4.6% vs 2.6%), somnolence (3.4% vs 2.2%) and hypertension (4.1% vs 2.8%).

Tabulated list of adverse reactions

The following Adverse Reactions listed in the Table below have been accumulated in clinical studies with memantine and since its introduction in the market.

Adverse reactions are ranked according to system organ class, using the following convention: very common ($\geq 1/10$), common ($\geq 1/100$ to $< 1/10$), uncommon ($\geq 1/1,000$ to $< 1/100$), rare ($\geq 1/10,000$ to $< 1/1,000$), very rare ($< 1/10,000$), not known (cannot be estimated from the available data). Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness.

Infections and infestations	Uncommon	Fungal infections
Immune system disorders	Common	Drug hypersensitivity
Psychiatric disorders	Common Uncommon Uncommon Not known	Somnolence Confusion Hallucinations ¹ Psychotic reactions ²

Nervous system disorders	Common Common Uncommon Very rare	Dizziness Balance disorders Gait abnormal Seizures
Cardiac disorders	Uncommon	Cardiac failure
Vascular disorders	Common Uncommon	Hypertension Venous thrombosis/thromboembolism
Respiratory, thoracic and mediastinal disorders	Common	Dyspnoea
Gastrointestinal disorders	Common Uncommon Not known	Constipation Vomiting Pancreatitis ²
Hepatobiliary disorders	Common Not known	Elevated liver function test Hepatitis
General disorders and administration site conditions	Common Uncommon	Headache Fatigue

¹ Hallucinations have mainly been observed in patients with severe Alzheimer's disease.

² Isolated cases reported in post-marketing experience.

Alzheimer's disease has been associated with depression, suicidal ideation and suicide. In post-marketing experience these reactions have been reported in patients treated with memantine.

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via the national reporting system listed in [Appendix V](#).

4.9 Overdose

Only limited experience with overdose is available from clinical studies and post-marketing experience.

Symptoms

Relative large overdoses (200 mg and 105 mg/day for 3 days, respectively) have been associated with either only symptoms of tiredness, weakness and/or diarrhoea or no symptoms. In the overdose cases below 140 mg or unknown dose the patients revealed symptoms from central nervous system (confusion, drowsiness, somnolence, vertigo, agitation, aggression, hallucination, and gait disturbance) and/or of gastrointestinal origin (vomiting and diarrhoea).

In the most extreme case of overdose, the patient survived the oral intake of a total of 2000 mg memantine with effects on the central nervous system (coma for 10 days, and later diplopia and agitation). The patient received symptomatic treatment and plasmapheresis. The patient recovered without permanent sequelae.

In another case of a large overdose, the patient also survived and recovered. The patient had received 400 mg memantine orally. The patient experienced central nervous system symptoms such as restlessness, psychosis, visual hallucinations, proconvulsiveness, somnolence, stupor, and unconsciousness.

Treatment

In the event of overdose, treatment should be symptomatic. No specific antidote for intoxication or overdose is available. Standard clinical procedures to remove active substance material, e.g. gastric lavage, carbo medicinalis (interruption of potential entero-hepatic recirculation), acidification of urine, forced diuresis should be used as appropriate.

In case of signs and symptoms of general central nervous system (CNS) overstimulation, careful symptomatic clinical treatment should be considered.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Psychoanaleptics. Other Anti-dementia drugs, ATC code: N06DX01.

There is increasing evidence that malfunctioning of glutamatergic neurotransmission, in particular at NMDA-receptors, contributes to both expression of symptoms and disease progression in neurodegenerative dementia.

Memantine is a voltage-dependent, moderate-affinity uncompetitive NMDA-receptor antagonist. It modulates the effects of pathologically elevated tonic levels of glutamate that may lead to neuronal dysfunction.

Clinical studies

A pivotal monotherapy study in a population of patients suffering from moderate to severe Alzheimer's disease (mini mental state examination (MMSE) total scores at baseline of 3-14) included a total of 252 outpatients. The study showed beneficial effects of memantine treatment in comparison to placebo at 6 months (observed cases analysis for the clinician's interview based impression of change (CIBIC-plus): $p=0.025$; Alzheimer's disease cooperative study – activities of daily living (ADCS-ADLsev): $p=0.003$; severe impairment battery (SIB): $p=0.002$).

A pivotal monotherapy study of memantine in the treatment of mild to moderate Alzheimer's disease (MMSE total scores at baseline of 10 to 22) included 403 patients. Memantine-treated patients showed a statistically significantly better effect than placebo-treated patients on the primary endpoints: Alzheimer's disease assessment scale (ADAS-cog) ($p=0.003$) and CIBIC-plus ($p=0.004$) at week 24 (last observation carried forward (LOCF)). In another monotherapy study in mild to moderate Alzheimer's disease a total of 470 patients (MMSE total scores at baseline of 11-23) were randomised. In the prospectively defined primary analysis statistical significance was not reached at the primary efficacy endpoint at week 24.

A meta-analysis of patients with moderate to severe Alzheimer's disease (MMSE total scores <20) from the six phase III, placebo-controlled, 6-month studies (including monotherapy studies and studies with patients on a stable dose of acetylcholinesterase inhibitors) showed that there was a statistically significant effect in favour of memantine treatment for the cognitive, global, and functional domains. When patients were identified with concurrent worsening in all three domains, results showed a statistically significant effect of memantine in preventing worsening, as twice as many placebo-treated patients as memantine-treated patients showed worsening in all three domains (21% vs. 11%, $p<0.0001$).

5.2 Pharmacokinetic properties

Absorption

Memantine has an absolute bioavailability of approximately 100%. T_{max} is between 3 and 8 hours. There is no indication that food influences the absorption of memantine.

Distribution

Daily doses of 20 mg lead to steady-state plasma concentrations of memantine ranging from 70 to 150 ng/ml (0.5-1 μmol) with large interindividual variations. When daily doses of 5 to 30 mg were

administered, a mean cerebrospinal fluid (CSF)/serum ratio of 0.52 was calculated. The volume of distribution is around 10 l/kg. About 45% of memantine is bound to plasma-proteins.

Biotransformation

In man, about 80% of the circulating memantine-related material is present as the parent compound. Main human metabolites are N-3,5-dimethyl-gludantan, the isomeric mixture of 4-and 6-hydroxy-memantine, and 1-nitroso-3,5-dimethyl-adamantane. None of these metabolites exhibit NMDA-antagonistic activity. No cytochrome P 450 catalysed metabolism has been detected *in vitro*.

In a study using orally administered ¹⁴C-memantine, a mean of 84% of the dose was recovered within 20 days, more than 99% being excreted renally.

Elimination

Memantine is eliminated in a monoexponential manner with a terminal $t_{1/2}$ of 60 to 100 hours. In volunteers with normal kidney function, total clearance (Cl_{tot}) amounts to 170 ml/min/1.73 m² and part of total renal clearance is achieved by tubular secretion.

Renal handling also involves tubular reabsorption, probably mediated by cation transport proteins. The renal elimination rate of memantine under alkaline urine conditions may be reduced by a factor of 7 to 9 (see section 4.4). Alkalisiation of urine may result from drastic changes in diet, e.g. from a carnivore to a vegetarian diet, or from the massive ingestion of alkalisating gastric buffers.

Linearity

Studies in volunteers have demonstrated linear pharmacokinetics in the dose range of 10 to 40 mg.

Pharmacokinetic/pharmacodynamic relationship

At a dose of memantine of 20 mg per day the CSF levels match the k_i -value (k_i = inhibition constant) of memantine, which is 0.5 μ mol in human frontal cortex.

5.3 Preclinical safety data

In short term studies in rats, memantine like other NMDA-antagonists have induced neuronal vacuolisation and necrosis (Olney lesions) only after doses leading to very high peak serum concentrations. Ataxia and other preclinical signs have preceded the vacuolisation and necrosis. As the effects have neither been observed in long term studies in rodents nor in non-rodents, the clinical relevance of these findings is unknown.

Ocular changes were inconsistently observed in repeat dose toxicity studies in rodents and dogs, but not in monkeys. Specific ophthalmoscopic examinations in clinical studies with memantine did not disclose any ocular changes.

Phospholipidosis in pulmonary macrophages due to accumulation of memantine in lysosomes was observed in rodents. This effect is known from other active substances with cationic amphiphilic properties. There is a possible relationship between this accumulation and the vacuolisation observed in lungs. This effect was only observed at high doses in rodents. The clinical relevance of these findings is unknown.

No genotoxicity has been observed following testing of memantine in standard assays. There was no evidence of any carcinogenicity in life long studies in mice and rats. Memantine was not teratogenic in rats and rabbits, even at maternally toxic doses, and no adverse effects of memantine were noted on fertility. In rats, foetal growth reduction was noted at exposure levels, which are identical or slightly higher than at human exposure.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Tablet core

Cellulose microcrystalline (E 460)
Starch pregelatinised (E 1404)
Lactose anhydrous
Colloidal anhydrous silica (E 551)
Magnesium stearate (E 470b)

Coating

Polysorbate 80 (E 433)
Polyvinyl alcohol (E 1203)
Titanium dioxide (E 171)
Talc (E 553b)
Soya lecithin (E 322)
Xanthan gum (E 415)

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

3 years

HDPE bottles:
Shelf life after first opening: 6 months

6.4 Special precautions for storage

Blister packs

Do not store above 25°C.

HDPE bottles

This medicinal product does not require any special storage conditions.

6.5 Nature and contents of container

10 mg film-coated tablets

PVC/PVDC-Aluminium foil blister packs
Pack sizes of 10, 14, 21, 28, 30, 42, 50, 56, 98, 100, 112 film-coated tablets.

HDPE (high-density polyethylene) bottles with PP (polypropylene) caps
Pack sizes of 100 film-coated tablets.

20 mg film-coated tablets

PVC/PVDC-Aluminium foil blister packs
Pack sizes of 10, 14, 21, 28, 30, 42, 56, 98, 100 film-coated tablets.

HDPE (high-density polyethylene) bottles with PP (polypropylene) caps
Pack sizes of 100 film-coated tablets.

Not all pack sizes may be marketed.

6.6 Special precautions for disposal

No special requirements.

7. MARKETING AUTHORISATION HOLDER

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

8. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/001
EU/1/13/836/002
EU/1/13/836/003
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EU/1/13/836/018
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EU/1/13/836/020
EU/1/13/836/021
EU/1/13/836/022

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 13 June 2013

Date of latest renewal:

10. DATE OF REVISION OF THE TEXT

Detailed information on this medicinal product is available on the website of the European Medicines Agency <http://www.ema.europa.eu>.

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 5 mg film-coated tablets
Memantine ratiopharm 10 mg film-coated tablets
Memantine ratiopharm 15 mg film-coated tablets
Memantine ratiopharm 20 mg film-coated tablets

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Memantine ratiopharm 5 mg

Each film-coated tablet contains 5 mg of memantine hydrochloride equivalent to 4.15 mg memantine.

Memantine ratiopharm 10 mg

Each film-coated tablet contains 10 mg of memantine hydrochloride equivalent to 8.31 mg memantine.

Memantine ratiopharm 15 mg

Each film-coated tablet contains 15 mg of memantine hydrochloride equivalent to 12.46 mg memantine.

Memantine ratiopharm 20 mg

Each film-coated tablet contains 20 mg of memantine hydrochloride equivalent to 16.62 mg memantine.

Excipients with known effect:

Memantine ratiopharm 5 mg

Lactose (40 mg/film-coated tablet) and soya lecithin (0.065 mg/film-coated tablet).

Memantine ratiopharm 10 mg

Lactose (80 mg/film-coated tablet) and soya lecithin (0.13 mg/film-coated tablet).

Memantine ratiopharm 15 mg

Lactose (120 mg/film-coated tablet) and soya lecithin (0.195 mg/film-coated tablet).

Memantine ratiopharm 20 mg

Lactose (160 mg/film-coated tablet) and soya lecithin (0.26 mg/film-coated tablet).

For the full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Film-coated tablet (tablet)

Memantine ratiopharm 5 mg

White to off-white, capsule shaped, biconvex tablets plain on one side and debossed with “5” on the other side.

Memantine ratiopharm 10 mg

White to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with “10” on the other side.

Memantine ratiopharm 15 mg

White to off-white, capsule shaped, biconvex tablets plain on one side and debossed with “15” on the other side.

Memantine ratiopharm 20 mg

White to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with “20” on the other side.

The 10 mg and 20 mg tablet can be divided into equal doses.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Treatment of adult patients with moderate to severe Alzheimer’s disease.

4.2 Posology and method of administration

Treatment should be initiated and supervised by a physician experienced in the diagnosis and treatment of Alzheimer’s dementia.

Posology

Therapy should only be started if a caregiver is available who will regularly monitor the intake of the medicinal product by the patient. Diagnosis should be made according to current guidelines. The tolerance and dosing of memantine should be reassessed on a regular basis, preferably within three months after start of treatment. Thereafter, the clinical benefit of memantine and the patient’s tolerance of treatment should be reassessed on a regular basis according to current clinical guidelines. Maintenance treatment can be continued for as long as a therapeutic benefit is favourable and the patient tolerates treatment with memantine. Discontinuation of memantine should be considered when evidence of a therapeutic effect is no longer present or if the patient does not tolerate treatment.

Adults

Dose titration

The recommended starting dose is 5 mg per day which is stepwise increased over the first 4 weeks of treatment reaching the recommended maintenance dose as follows:

Week 1 (day 1-7):

The patient should take one 5 mg film-coated tablet per day (white to off-white, capsule shaped, biconvex tablets plain on one side and debossed with “5” on the other side) for 7 days.

Week 2 (day 8-14):

The patient should take one 10 mg film-coated tablet per day (white to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with “10” on the other side.) for 7 days.

Week 3 (day 15-21):

The patient should take one 15 mg film-coated tablet per day (white to off-white, capsule shaped, biconvex tablets plain on one side and debossed with “15” on the other side.) for 7 days.

Week 4 (day 22-28):

The patient should take one 20 mg film-coated tablet per day (white to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with “20” on the other side.) for 7 days. The maximum daily dose is 20 mg per day.

Maintenance dose

The recommended maintenance dose is 20 mg per day.

Elderly

On the basis of the clinical studies, the recommended dose for patients over the age of 65 years is 20 mg per day (20 mg once a day) as described above.

Renal impairment

In patients with mildly impaired renal function (creatinine clearance 50-80 ml/min) no dose adjustment is required. In patients with moderate renal impairment (creatinine clearance 30-49 ml/min) daily dose should be 10 mg per day. If tolerated well after at least 7 days of treatment, the dose could be increased up to 20 mg/day according to standard titration scheme. In patients with severe renal impairment (creatinine clearance 5-29 ml/min) daily dose should be 10 mg per day.

Hepatic impairment

In patients with mild or moderate hepatic impaired function (Child-Pugh A and Child-Pugh B), no dose adjustment is needed. No data on the use of memantine in patients with severe hepatic impairment are available. Administration of Memantine ratiopharm is not recommended in patients with severe hepatic impairment.

Paediatric population

No data available.

Method of administration

Memantine ratiopharm should be administered orally once a day and should be taken at the same time every day. The film-coated tablets can be taken with or without food.

4.3 Contraindications

Hypersensitivity to the active substance, peanut or soya or to any of the excipients listed in section 6.1.

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Some factors that may raise urine pH (see section 5.2 “Elimination”) may necessitate careful monitoring of the patient. These factors include drastic changes in diet, e.g. from a carnivore to a

vegetarian diet, or a massive ingestion of alkalisating gastric buffers. Also, urine pH may be elevated by states of renal tubular acidosis (RTA) or severe infections of the urinary tract with *Proteus* bacteria.

In most clinical trials, patients with recent myocardial infarction, uncompensated congestive heart failure (NYHA III-IV), or uncontrolled hypertension were excluded. As a consequence, only limited data are available and patients with these conditions should be closely supervised.

Excipients

Memantine ratiopharm contains lactose. Patients with rare hereditary problems of galactose intolerance, the Lapp lactase deficiency or glucose-galactose malabsorption should not take this medicine.

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- Other active substances such as cimetidine, ranitidine, procainamide, quinidine, quinine and nicotine that use the same renal cationic transport system as amantadine may also possibly interact with memantine leading to a potential risk of increased plasma levels.
- There may be a possibility of reduced serum level of hydrochlorothiazide (HCT) when memantine is co-administered with HCT or any combination with HCT.
- In post-marketing experience, isolated cases with international normalized ratio (INR) increases have been reported in patients concomitantly treated with warfarin. Although no causal relationship has been established, close monitoring of prothrombin time or INR is advisable for patients concomitantly treated with oral anticoagulants.

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In a clinical study in young healthy subjects, no relevant effect of memantine on the pharmacokinetics of galantamine was observed.

Memantine did not inhibit CYP 1A2, 2A6, 2C9, 2D6, 2E1, 3A, flavin containing monooxygenase, epoxide hydrolase or sulphation *in vitro*.

4.6 Fertility, pregnancy and lactation

Pregnancy

There are no or limited amount of data from the use of memantine in pregnant women. Animal studies indicate a potential for reducing intrauterine growth at exposure levels, which are identical or slightly higher than at human exposure (see section 5.3). The potential risk for humans is unknown.

Memantine should not be used during pregnancy unless clearly necessary.

Breast-feeding

It is not known whether memantine is excreted in human breast milk but, taking into consideration the lipophilicity of the substance, this probably occurs. Women taking memantine should not breast-feed.

Fertility

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Moderate to severe Alzheimer's disease usually causes impairment of driving performance and compromises the ability to use machinery. Furthermore, Memantine ratiopharm has minor to moderate influence on the ability to drive and use machines such that outpatients should be warned to take special care.

4.8 Undesirable effects

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Tabulated list of adverse reactions

The following Adverse Reactions listed in the Table below have been accumulated in clinical studies with memantine and since its introduction in the market.

Adverse reactions are ranked according to system organ class, using the following convention: very common ($\geq 1/10$), common ($\geq 1/100$ to $< 1/10$), uncommon ($\geq 1/1,000$ to $< 1/100$), rare ($\geq 1/10,000$ to $< 1/1,000$), very rare ($< 1/10,000$), not known (cannot be estimated from the available data). Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness.

Infections and infestations	Uncommon	Fungal infections
Immune system disorders	Common	Drug hypersensitivity
Psychiatric disorders	Common Uncommon Uncommon Not known	Somnolence Confusion Hallucinations ¹ Psychotic reactions ²
Nervous system disorders	Common Common Uncommon Very rare	Dizziness Balance disorders Gait abnormal Seizures
Cardiac disorders	Uncommon	Cardiac failure
Vascular disorders	Common Uncommon	Hypertension Venous thrombosis/thromboembolism
Respiratory, thoracic and mediastinal disorders	Common	Dyspnoea
Gastrointestinal disorders	Common Uncommon Not known	Constipation Vomiting Pancreatitis ²
Hepatobiliary disorders	Common Not known	Elevated liver function test Hepatitis

General disorders and administration site conditions	Common Uncommon	Headache Fatigue
--	--------------------	---------------------

¹ Hallucinations have mainly been observed in patients with severe Alzheimer's disease.

² Isolated cases reported in post-marketing experience.

Alzheimer's disease has been associated with depression, suicidal ideation and suicide. In post-marketing experience these reactions have been reported in patients treated with memantine.

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via the national reporting system listed in Appendix V.

4.9 Overdose

Only limited experience with overdose is available from clinical studies and post-marketing experience.

Symptoms

Relative large overdoses (200 mg and 105 mg/day for 3 days, respectively) have been associated with either only symptoms of tiredness, weakness and/or diarrhoea or no symptoms. In the overdose cases below 140 mg or unknown dose the patients revealed symptoms from central nervous system (confusion, drowsiness, somnolence, vertigo, agitation, aggression, hallucination, and gait disturbance) and/or of gastrointestinal origin (vomiting and diarrhoea).

In the most extreme case of overdose, the patient survived the oral intake of a total of 2000 mg memantine with effects on the central nervous system (coma for 10 days, and later diplopia and agitation). The patient received symptomatic treatment and plasmapheresis. The patient recovered without permanent sequelae.

In another case of a large overdose, the patient also survived and recovered. The patient had received 400 mg memantine orally. The patient experienced central nervous system symptoms such as restlessness, psychosis, visual hallucinations, proconvulsiveness, somnolence, stupor, and unconsciousness.

Treatment

In the event of overdose, treatment should be symptomatic. No specific antidote for intoxication or overdose is available. Standard clinical procedures to remove active substance material, e.g. gastric lavage, carbo medicinalis (interruption of potential entero-hepatic recirculation), acidification of urine, forced diuresis should be used as appropriate.

In case of signs and symptoms of general central nervous system (CNS) overstimulation, careful symptomatic clinical treatment should be considered.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Psychoanaleptics. Other Anti-dementia drugs, ATC code: N06DX01.

There is increasing evidence that malfunctioning of glutamatergic neurotransmission, in particular at NMDA-receptors, contributes to both expression of symptoms and disease progression in neurodegenerative dementia.

Memantine is a voltage-dependent, moderate-affinity uncompetitive NMDA-receptor antagonist. It modulates the effects of pathologically elevated tonic levels of glutamate that may lead to neuronal dysfunction.

Clinical studies

A pivotal monotherapy study in a population of patients suffering from moderate to severe Alzheimer's disease (mini mental state examination (MMSE) total scores at baseline of 3-14) included a total of 252 outpatients. The study showed beneficial effects of memantine treatment in comparison to placebo at 6 months (observed cases analysis for the clinician's interview based impression of change (CIBIC-plus): $p=0.025$; Alzheimer's disease cooperative study – activities of daily living (ADCS-ADLsev): $p=0.003$; severe impairment battery (SIB): $p=0.002$).

A pivotal monotherapy study of memantine in the treatment of mild to moderate Alzheimer's disease (MMSE total scores at baseline of 10 to 22) included 403 patients. Memantine-treated patients showed a statistically significantly better effect than placebo-treated patients on the primary endpoints: Alzheimer's disease assessment scale (ADAS-cog) ($p=0.003$) and CIBIC-plus ($p=0.004$) at week 24 (last observation carried forward (LOCF)). In another monotherapy study in mild to moderate Alzheimer's disease a total of 470 patients (MMSE total scores at baseline of 11-23) were randomised. In the prospectively defined primary analysis statistical significance was not reached at the primary efficacy endpoint at week 24.

A meta-analysis of patients with moderate to severe Alzheimer's disease (MMSE total scores <20) from the six phase III, placebo-controlled, 6-month studies (including monotherapy studies and studies with patients on a stable dose of acetylcholinesterase inhibitors) showed that there was a statistically significant effect in favour of memantine treatment for the cognitive, global, and functional domains. When patients were identified with concurrent worsening in all three domains, results showed a statistically significant effect of memantine in preventing worsening, as twice as many placebo-treated patients as memantine-treated patients showed worsening in all three domains (21% vs. 11%, $p<0.0001$).

5.2 Pharmacokinetic properties

Absorption

Memantine has an absolute bioavailability of approximately 100%. T_{max} is between 3 and 8 hours. There is no indication that food influences the absorption of memantine.

Distribution

Daily doses of 20 mg lead to steady-state plasma concentrations of memantine ranging from 70 to 150 ng/ml (0.5-1 μmol) with large interindividual variations. When daily doses of 5 to 30 mg were administered, a mean cerebrospinal fluid (CSF)/serum ratio of 0.52 was calculated. The volume of distribution is around 10 l/kg. About 45% of memantine is bound to plasma-proteins.

Biotransformation

In man, about 80% of the circulating memantine-related material is present as the parent compound. Main human metabolites are N-3,5-dimethyl-gludantan, the isomeric mixture of 4- and 6-hydroxy-memantine, and 1-nitroso-3,5-dimethyl-adamantane. None of these metabolites exhibit NMDA-antagonistic activity. No cytochrome P 450 catalysed metabolism has been detected *in vitro*.

In a study using orally administered ^{14}C -memantine, a mean of 84% of the dose was recovered within 20 days, more than 99% being excreted renally.

Elimination

Memantine is eliminated in a monoexponential manner with a terminal $t_{1/2}$ of 60 to 100 hours. In volunteers with normal kidney function, total clearance (Cl_{tot}) amounts to 170 ml/min/1.73 m² and part of total renal clearance is achieved by tubular secretion.

Renal handling also involves tubular reabsorption, probably mediated by cation transport proteins. The renal elimination rate of memantine under alkaline urine conditions may be reduced by a factor of 7 to 9 (see section 4.4). Alkalisiation of urine may result from drastic changes in diet, e.g. from a carnivore to a vegetarian diet, or from the massive ingestion of alkalisating gastric buffers.

Linearity

Studies in volunteers have demonstrated linear pharmacokinetics in the dose range of 10 to 40 mg.

Pharmacokinetic/pharmacodynamic relationship

At a dose of memantine of 20 mg per day the CSF levels match the k_i -value (k_i = inhibition constant) of memantine, which is 0.5 μ mol in human frontal cortex.

5.3 Preclinical safety data

In short term studies in rats, memantine like other NMDA-antagonists have induced neuronal vacuolisation and necrosis (Olney lesions) only after doses leading to very high peak serum concentrations. Ataxia and other preclinical signs have preceded the vacuolisation and necrosis. As the effects have neither been observed in long term studies in rodents nor in non-rodents, the clinical relevance of these findings is unknown.

Ocular changes were inconsistently observed in repeat dose toxicity studies in rodents and dogs, but not in monkeys. Specific ophthalmoscopic examinations in clinical studies with memantine did not disclose any ocular changes.

Phospholipidosis in pulmonary macrophages due to accumulation of memantine in lysosomes was observed in rodents. This effect is known from other active substances with cationic amphiphilic properties. There is a possible relationship between this accumulation and the vacuolisation observed in lungs. This effect was only observed at high doses in rodents. The clinical relevance of these findings is unknown.

No genotoxicity has been observed following testing of memantine in standard assays. There was no evidence of any carcinogenicity in life long studies in mice and rats. Memantine was not teratogenic in rats and rabbits, even at maternally toxic doses, and no adverse effects of memantine were noted on fertility. In rats, foetal growth reduction was noted at exposure levels, which are identical or slightly higher than at human exposure.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Tablet core

Cellulose microcrystalline (E 460)
Starch pregelatinised (E 1404)
Lactose anhydrous
Colloidal anhydrous silica (E 551)
Magnesium stearate (E 470b)

Coating

Polysorbate 80 (E 433)
Polyvinyl alcohol (E 1203)
Titanium dioxide (E 171)
Talc (E 553b)
Soya lecithin (E 322)
Xanthan gum (E 415)

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

3 years

6.4 Special precautions for storage

Do not store above 25°C.

6.5 Nature and contents of container

PVC/PVDC-Aluminium foil blister packs
Pack sizes of 28 (7 +7 +7 + 7) film-coated tablets.

6.6 Special precautions for disposal

No special requirements.

7. MARKETING AUTHORISATION HOLDER

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

8. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/023

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 13 June 2013
Date of latest renewal:

10. DATE OF REVISION OF THE TEXT

Detailed information on this medicinal product is available on the website of the European Medicines Agency <http://www.ema.europa.eu>.

ANNEX II

- A. MANUFACTURERS RESPONSIBLE FOR BATCH RELEASE**
- B. CONDITIONS OR RESTRICTIONS REGARDING SUPPLY AND USE**
- C. OTHER CONDITIONS AND REQUIREMENTS OF THE MARKETING AUTHORISATION**
- D. CONDITIONS OR RESTRICTIONS WITH REGARD TO THE SAFE AND EFFECTIVE USE OF THE MEDICINAL PRODUCT**

A. MANUFACTURERS RESPONSIBLE FOR BATCH RELEASE

Name and address of the manufacturers responsible for batch release

HBM Pharma s.r.o.
Sklabinská 30
SL-03680 Martin
Slovakia

Merckle GmbH
Ludwig-Merckle-Strasse 3
D-89143 Blaubeuren-Weiler
Germany

Teva Pharmaceutical Works Private Limited Company
Pallagi út 13
HU-4042 Debrecen
Hungary

The printed package leaflet of the medicinal product must state the name and address of the manufacturer responsible for the release of the concerned batch.

B. CONDITIONS OR RESTRICTIONS REGARDING SUPPLY AND USE

Medicinal product subject to restricted prescription (see Annex I: Summary of Product Characteristics, section 4.2).

C. OTHER CONDITIONS AND REQUIREMENTS OF THE MARKETING AUTHORISATION

- **Periodic safety update reports**

The requirements for submission of periodic safety update reports for this medicinal product are set out in the list of Union reference dates (EURD list) provided for under Article 107c(7) of Directive 2001/83/EC and any subsequent updates published on the European medicines web-portal.

D. CONDITIONS OR RESTRICTIONS WITH REGARD TO THE SAFE AND EFFECTIVE USE OF THE MEDICINAL PRODUCT

- **Risk Management Plan (RMP)**

Not applicable.

ANNEX III
LABELLING AND PACKAGE LEAFLET

A. LABELLING

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging (Blister)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 10 mg film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 10 mg memantine hydrochloride equivalent to 8.31 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

10 film-coated tablets

14 film-coated tablets

21 film-coated tablets

28 film-coated tablets

30 film-coated tablets

42 film-coated tablets

50 film-coated tablets

56 film-coated tablets

98 film-coated tablets

100 film-coated tablets

112 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Once daily

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

9. SPECIAL STORAGE CONDITIONS

Do not store above 25°C.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/001 10 film-coated tablets
EU/1/13/836/002 14 film-coated tablets
EU/1/13/836/003 21 film-coated tablets
EU/1/13/836/004 28 film-coated tablets
EU/1/13/836/005 30 film-coated tablets
EU/1/13/836/006 42 film-coated tablets
EU/1/13/836/007 50 film-coated tablets
EU/1/13/836/008 56 film-coated tablets
EU/1/13/836/009 98 film-coated tablets
EU/1/13/836/010 100 film-coated tablets
EU/1/13/836/011 112 film-coated tablets

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY**15. INSTRUCTIONS ON USE**

16. INFORMATION IN BRAILLE

Memantine ratiopharm 10 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

2D barcode carrying the unique identifier included.

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

PC:

SN:

NN:

MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

Blister

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 10 mg film-coated tablets

memantine hydrochloride

2. NAME OF THE MARKETING AUTHORISATION HOLDER

ratiopharm

3. EXPIRY DATE

EXP

4. BATCH NUMBER

Batch

5. OTHER

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging (Blister)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 20 mg film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 20 mg memantine hydrochloride equivalent to 16.62 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

10 film-coated tablets
14 film-coated tablets
21 film-coated tablets
28 film-coated tablets
30 film-coated tablets
42 film-coated tablets
56 film-coated tablets
98 film-coated tablets
100 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Once daily

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

9. SPECIAL STORAGE CONDITIONS

Do not store above 25°C.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/013 10 film-coated tablets
EU/1/13/836/014 14 film-coated tablets
EU/1/13/836/015 21 film-coated tablets
EU/1/13/836/016 28 film-coated tablets
EU/1/13/836/017 30 film-coated tablets
EU/1/13/836/018 42 film-coated tablets
EU/1/13/836/019 56 film-coated tablets
EU/1/13/836/020 98 film-coated tablets
EU/1/13/836/021 100 film-coated tablets

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY**15. INSTRUCTIONS ON USE****16. INFORMATION IN BRAILLE**

Memantine ratiopharm 20 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

2D barcode carrying the unique identifier included.

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

PC:
SN:
NN:

MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

Blister

1. NAME OF THE MEDICINAL PRODUCT

memantine ratiopharm 20 mg film-coated tablets

Memantine hydrochloride

2. NAME OF THE MARKETING AUTHORISATION HOLDER

ratiopharm

3. EXPIRY DATE

EXP

4. BATCH NUMBER

Batch

5. OTHER

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging (HDPE bottle)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 10 mg film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 10 mg memantine hydrochloride equivalent to 8.31 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

100 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

Shelf life after first opening: 6 months.

9. SPECIAL STORAGE CONDITIONS

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/012

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Memantine ratiopharm 10 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

2D barcode carrying the unique identifier included.

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

PC:
SN:
NN:

PARTICULARS TO APPEAR ON THE IMMEDIATE PACKAGING

Label (HDPE bottle)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 10 mg tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each tablet contains 10 mg memantine hydrochloride equivalent to 8.31 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

100 tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

Shelf life after first opening: 6 months.

9. SPECIAL STORAGE CONDITIONS

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/012

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

17. UNIQUE IDENTIFIER – 2D BARCODE

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging (HDPE bottle)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 20 mg film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 20 mg memantine hydrochloride equivalent to 16.62 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

100 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Once daily

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

Shelf life after first opening: 6 months.

9. SPECIAL STORAGE CONDITIONS

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/022

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Memantine ratiopharm 20 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

2D barcode carrying the unique identifier included.

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

PC:
SN:
NN:

PARTICULARS TO APPEAR ON THE IMMEDIATE PACKAGING

Label (HDPE bottle)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 20 mg tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each tablet contains 20 mg memantine hydrochloride equivalent to 16.62 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

100 tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Once daily

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

Shelf life after first opening: 6 months.

9. SPECIAL STORAGE CONDITIONS

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/022

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

17. UNIQUE IDENTIFIER – 2D BARCODE

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging for 4 week treatment initiation pack (28 tablets, week 1-4)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 5 mg
Memantine ratiopharm 10 mg
Memantine ratiopharm 15 mg
Memantine ratiopharm 20 mg
film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 5 mg or 10 mg or 15 mg or 20 mg of memantine hydrochloride equivalent to 4.15 mg or 8.31 mg or 12.46 mg or 16.62 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Treatment initiation pack

Each pack of 28 film-coated tablets for a 4 week treatment schedule contains:
7 x 5 mg and 7 x 10 mg and 7 x 15 mg and 7 x 20 mg film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Once daily

For continuation of your treatment please consult your doctor.

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

9. SPECIAL STORAGE CONDITIONS

Do not store above 25°C.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/023

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY**15. INSTRUCTIONS ON USE****16. INFORMATION IN BRAILLE**

Memantine ratiopharm 5 mg
Memantine ratiopharm 10 mg
Memantine ratiopharm 15 mg
Memantine ratiopharm 20 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

2D barcode carrying the unique identifier included.

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

PC:
SN:
NN:

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging for 4 week treatment initiation pack (5 mg, 7 tablets, week 1)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 5 mg film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 5 mg memantine hydrochloride equivalent to 4.15 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

7 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Take only one tablet per day

Week 1

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

9. SPECIAL STORAGE CONDITIONS

Do not store above 25°C.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/023

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY**15. INSTRUCTIONS ON USE****16. INFORMATION IN BRAILLE**

Memantine ratiopharm 5 mg

17. UNIQUE IDENTIFIER – 2D BARCODE**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

Blister

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 5 mg film-coated tablets

memantine hydrochloride

2. NAME OF THE MARKETING AUTHORISATION HOLDER

ratiopharm

3. EXPIRY DATE

EXP

4. BATCH NUMBER

Batch

5. OTHER

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging for 4 week treatment initiation pack (10 mg, 7 tablets, week 2)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 10 mg film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 10 mg memantine hydrochloride equivalent to 8.31 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

7 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Take only one tablet per day

Week 2

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

9. SPECIAL STORAGE CONDITIONS

Do not store above 25°C.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/023

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Memantine ratiopharm 10 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

Blister

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 10 mg film-coated tablets

memantine hydrochloride

2. NAME OF THE MARKETING AUTHORISATION HOLDER

ratiopharm

3. EXPIRY DATE

EXP

4. BATCH NUMBER

Batch

5. OTHER

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging for 4 week treatment initiation pack (15 mg, 7 tablets, week 3)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 15 mg film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 15 mg memantine hydrochloride equivalent to 12.46 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

7 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Take only one tablet per day

Week 3

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

9. SPECIAL STORAGE CONDITIONS

Do not store above 25°C.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/023

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY**15. INSTRUCTIONS ON USE****16. INFORMATION IN BRAILLE**

Memantine ratiopharm 15 mg

17. UNIQUE IDENTIFIER – 2D BARCODE**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

Blister

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 15 mg film-coated tablets

memantine hydrochloride

2. NAME OF THE MARKETING AUTHORISATION HOLDER

ratiopharm

3. EXPIRY DATE

EXP

4. BATCH NUMBER

Batch

5. OTHER

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

Outer packaging for 4 week treatment initiation pack (20 mg, 7 tablets, week 4)

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 20 mg film-coated tablets

memantine hydrochloride

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 20 mg memantine hydrochloride equivalent to 16.62 mg memantine.

3. LIST OF EXCIPIENTS

Contains lactose and soya lecithin. Read the package leaflet before use.

4. PHARMACEUTICAL FORM AND CONTENTS

Film-coated tablet

7 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.

Oral use

Take only one tablet per day

Week 4

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

9. SPECIAL STORAGE CONDITIONS

Do not store above 25°C.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/13/836/023

13. BATCH NUMBER

Batch

14. GENERAL CLASSIFICATION FOR SUPPLY

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Memantine ratiopharm 20 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

18. UNIQUE IDENTIFIER – HUMAN READABLE DATA

MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

Blister

1. NAME OF THE MEDICINAL PRODUCT

Memantine ratiopharm 20 mg film-coated tablets

memantine hydrochloride

2. NAME OF THE MARKETING AUTHORISATION HOLDER

ratiopharm

3. EXPIRY DATE

EXP

4. BATCH NUMBER

Batch

5. OTHER

B. PACKAGE LEAFLET

Package leaflet: Information for the patient

Memantine ratiopharm 10 mg film-coated tablets memantine hydrochloride

Read all of this leaflet carefully before you start taking this medicine because it contains important information for you.

- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor or pharmacist.
- This medicine has been prescribed for you only. Do not pass it on to others. It may harm them, even if their signs of illness are the same as yours.
- If you get any side effects, talk to your doctor or pharmacist. This includes any possible side effects not listed in this leaflet. See section 4.

What is in this leaflet

1. What Memantine ratiopharm is and what it is used for
2. What you need to know before you take Memantine ratiopharm
3. How to take Memantine ratiopharm
4. Possible side effects
5. How to store Memantine ratiopharm
6. Contents of the pack and other information

1. What Memantine ratiopharm is and what it is used for

How does Memantine ratiopharm work

Memantine ratiopharm contains the active substance memantine hydrochloride. It belongs to a group of medicines known as anti-dementia medicines.

Memory loss in Alzheimer's disease is due to a disturbance of message signals in the brain. The brain contains so-called N-methyl-D-aspartate (NMDA)-receptors that are involved in transmitting nerve signals important in learning and memory. Memantine ratiopharm belongs to a group of medicines called NMDA-receptor antagonists. Memantine ratiopharm acts on these NMDA-receptors improving the transmission of nerve signals and the memory.

What is Memantine ratiopharm used for

Memantine ratiopharm is used for the treatment of patients with moderate to severe Alzheimer's disease.

2. What you need to know before you take Memantine ratiopharm

Do not take Memantine ratiopharm:

- if you are allergic to memantine hydrochloride, peanut or soya or any of the other ingredients of this medicine (listed in section 6).

Warnings and precautions

Talk to your doctor or pharmacist before taking Memantine ratiopharm:

- if you have a history of epileptic seizures.
- if you have recently experienced a myocardial infarction (heart attack), or if you are suffering from congestive heart failure or from an uncontrolled hypertension (high blood pressure).

In these situations the treatment should be carefully supervised, and the clinical benefit of Memantine ratiopharm reassessed by your doctor on a regular basis.

If you suffer from renal impairment (kidney problems), your doctor should closely monitor your kidney function and if necessary adapt the memantine doses accordingly.

The use of medicinal products called

- amantadine (for the treatment of Parkinson's disease),
- ketamine (a substance generally used as an anaesthetic),
- dextromethorphan (generally used to treat cough) and
- other NMDA-antagonists

at the same time should be avoided.

Children and adolescents

Memantine ratiopharm is not recommended for children and adolescents under the age of 18 years.

Other medicines and Memantine ratiopharm

Tell your doctor or pharmacist if you are taking/using, have recently taken/used or might take/use any other medicines.

In particular, Memantine ratiopharm may change the effects of the following medicines and their dose may need to be adjusted by your doctor:

- amantadine, ketamine, dextromethorphan
- dantrolene, baclofen
- cimetidine, ranitidine, procainamide, quinidine, quinine, nicotine
- hydrochlorothiazide (or any combination with hydrochlorothiazide)
- anticholinergics (substances generally used to treat movement disorders or intestinal cramps)
- anticonvulsants (substances used to prevent and relieve seizures)
- barbiturates (substances generally used to induce sleep)
- dopaminergic agonists (substances such as L-dopa, bromocriptine)
- neuroleptics (substances used in the treatment of mental disorders)
- oral anticoagulants

If you go into hospital, let your doctor know that you are taking Memantine ratiopharm.

Memantine ratiopharm with food and drink

You should inform your doctor if you have recently changed or intend to change your diet substantially (e.g. from normal diet to strict vegetarian diet) or if you are suffering from states of renal tubular acidosis (RTA, an excess of acid-forming substances in the blood due to renal dysfunction (poor kidney function)) or severe infections of the urinary tract (structure that carries urine), as your doctor may need to adjust the dose of your medicine.

Pregnancy and breast-feeding

If you are pregnant or breast-feeding, think you may be pregnant or are planning to have a baby, ask your doctor or pharmacist for advice before taking this medicine.

The use of memantine in pregnant women is not recommended.

Women taking Memantine ratiopharm should not breast-feed.

Driving and using machines

Your doctor will tell you whether your illness allows you to drive and to use machines safely. Also, Memantine ratiopharm may change your reactivity, making driving or operating machinery inappropriate.

Memantine ratiopharm contains lactose and soya lecithin

This medicine contains lactose. If you have been told by your doctor that you have an intolerance to some sugars, contact your doctor before taking this medicinal product.

This medicine contains soya lecithin. If you are allergic to peanut or soya, do not take this medicinal product.

3. How to take Memantine ratiopharm

Always take this medicine exactly as your doctor has told you. Check with your doctor or pharmacist if you are not sure.

Dosage

The recommended dose of Memantine ratiopharm for adults and older patients is 20 mg once a day. In order to reduce the risk of side effects this dose is achieved gradually by the following daily treatment scheme:

week 1	half a 10 mg tablet
week 2	one 10 mg tablet
week 3	one and a half 10 mg tablets
week 4 and beyond	two 10 mg tablets once a day

The usual starting dose is half a tablet once a day (1x 5 mg) for the first week. This is increased to one tablet once a day (1x 10 mg) in the second week and to one and a half tablets once a day in the third week. From the fourth week on, the usual dose is two tablets once a day (1x 20 mg).

The tablet can be divided into equal doses.

Dosage in patients with impaired kidney function

If you have impaired kidney function, your doctor will decide upon a dose that suits your condition. In this case, monitoring of your kidney function should be performed by your doctor at specified intervals.

Administration

Memantine ratiopharm should be administered orally once a day. To benefit from your medicine you should take it regularly every day at the same time of the day.

The tablets should be swallowed with some water. The tablets can be taken with or without food.

Duration of treatment

Continue to take Memantine ratiopharm as long as it is of benefit to you. Your doctor should assess your treatment on a regular basis.

If you take more Memantine ratiopharm than you should

- In general, taking too much Memantine ratiopharm should not result in any harm to you. You may experience increased symptoms as described in section 4. "Possible side effects".
- If you take a large overdose of Memantine ratiopharm, contact your doctor or get medical advice, as you may need medical attention.

If you forget to take Memantine ratiopharm

- If you find you have forgotten to take your dose of Memantine ratiopharm, wait and take your next dose at the usual time.
- Do not take a double dose to make up for a forgotten dose.

If you have any further questions on the use of this medicine, ask your doctor or pharmacist.

4. Possible side effects

Like all medicines, this medicine can cause side effects, although not everybody gets them.

In general, the observed side effects are mild to moderate.

Common (affects 1 to 10 users in 100):

- Headache, sleepiness, constipation, elevated liver function tests, dizziness, balance disorders, shortness of breath, high blood pressure and drug hypersensitivity

Uncommon (affects 1 to 10 users in 1,000):

- Tiredness, fungal infections, confusion, hallucinations, vomiting, abnormal gait, heart failure and venous blood clotting (thrombosis/thromboembolism)

Very Rare (affects less than 1 user in 10,000):

- Seizures

Not known (frequency cannot be estimated from the available data):

- Inflammation of the pancreas, inflammation of the liver (hepatitis) and psychotic reactions

Alzheimer's disease has been associated with depression, suicidal ideation and suicide. These events have been reported in patients treated with memantine.

Reporting of side effects

If you get any side effects, talk to your doctor or pharmacist. This includes any possible side effects not listed in this leaflet. You can also report side effects directly via [the national reporting system listed in Appendix V](#). By reporting side effects you can help provide more information on the safety of this medicine.

5. How to store Memantine ratiopharm

Keep this medicine out of the sight and reach of children.

Do not use this medicine after the expiry date which is stated on the carton and the blister pack after EXP. The expiry date refers to the last day of that month.

Blister packs

Do not store above 25°C.

HDPE bottles

This medicinal product does not require any special storage conditions.

Shelf life after first opening of the container: 6 months

Do not throw away any medicines via wastewater or household waste. Ask your pharmacist how to throw away medicines you no longer use. These measures will help protect the environment.

6. Contents of the pack and other information

What Memantine ratiopharm contains

- The active substance is memantine hydrochloride.
Each film-coated tablet contains 10 mg memantine hydrochloride equivalent to 8.31 mg memantine.
- The other ingredients are:
Tablet core
Cellulose microcrystalline (E 460), starch pregelatinised (E 1404), lactose anhydrous, colloidal anhydrous silica (E 551), magnesium stearate (E 470b).
Coating
Polysorbate 80 (E 433), polyvinyl alcohol (E 1203), titanium dioxide (E 171), talc (E 553b), soya lecithin (E 322), xanthan gum (E 415).

What Memantine ratiopharm looks like and contents of the pack

White to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with “10” on the other side.

Memantine ratiopharm is available in packs of 10, 14, 21, 28, 30, 42, 50, 56, 98, 100 and 112 film-coated tablets.

Not all pack sizes may be marketed.

Marketing Authorisation Holder

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

Manufacturer

Merckle GmbH
Ludwig-Merckle-Straße 3
89143 Blaubeuren
Germany

TEVA Pharmaceutical Works Private Limited Company
Pallagi út 13, 4042 Debrecen
Hungary

HBM Pharma s.r.o.
Slabinská 30, 03680 Martin
Slovakia

For any information about this medicine, please contact the local representative of the Marketing Authorisation Holder:

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Lietuva

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Teva Santé
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Ísland

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This leaflet was last revised in

Detailed information on this medicine is available on the European Medicines Agency web site:
<http://www.ema.europa.eu>.

Package leaflet: Information for the patient

Memantine ratiopharm 20 mg film-coated tablets memantine hydrochloride

Read all of this leaflet carefully before you start taking this medicine because it contains important information for you.

- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor or pharmacist.
- This medicine has been prescribed for you only. Do not pass it on to others. It may harm them, even if their signs of illness are the same as yours.
- If you get any side effects, talk to your doctor or pharmacist. This includes any possible side effects not listed in this leaflet. See section 4.

What is in this leaflet

1. What Memantine ratiopharm is and what it is used for
2. What you need to know before you take Memantine ratiopharm
3. How to take Memantine ratiopharm
4. Possible side effects
5. How to store Memantine ratiopharm
6. Contents of the pack and other information

1. What Memantine ratiopharm is and what it is used for

How does Memantine ratiopharm work

Memantine ratiopharm contains the active substance memantine hydrochloride. It belongs to a group of medicines known as anti-dementia medicines.

Memory loss in Alzheimer's disease is due to a disturbance of message signals in the brain. The brain contains so-called N-methyl-D-aspartate (NMDA)-receptors that are involved in transmitting nerve signals important in learning and memory. Memantine ratiopharm belongs to a group of medicines called NMDA-receptor antagonists. Memantine ratiopharm acts on these NMDA-receptors improving the transmission of nerve signals and the memory.

What is Memantine ratiopharm used for

Memantine ratiopharm is used for the treatment of patients with moderate to severe Alzheimer's disease.

2. What you need to know before you take Memantine ratiopharm

Do not take Memantine ratiopharm:

- if you are allergic to memantine hydrochloride, peanut or soya or any of the other ingredients of this medicine (listed in section 6).

Warnings and precautions

Talk to your doctor or pharmacist before taking Memantine ratiopharm:

- if you have a history of epileptic seizures.
- if you have recently experienced a myocardial infarction (heart attack), or if you are suffering from congestive heart failure or from an uncontrolled hypertension (high blood pressure).

In these situations the treatment should be carefully supervised, and the clinical benefit of Memantine ratiopharm reassessed by your doctor on a regular basis.

If you suffer from renal impairment (kidney problems), your doctor should closely monitor your kidney function and if necessary adapt the memantine doses accordingly.

The use of medicinal products called

- amantadine (for the treatment of Parkinson's disease),
- ketamine (a substance generally used as an anaesthetic),
- dextromethorphan (generally used to treat cough) and
- other NMDA-antagonists

at the same time should be avoided.

Children and adolescents

Memantine ratiopharm is not recommended for children and adolescents under the age of 18 years.

Other medicines and Memantine ratiopharm

Tell your doctor or pharmacist if you are taking/using, have recently taken/used or might take/use any other medicines.

In particular, Memantine ratiopharm may change the effects of the following medicines and their dose may need to be adjusted by your doctor:

- amantadine, ketamine, dextromethorphan
- dantrolene, baclofen
- cimetidine, ranitidine, procainamide, quinidine, quinine, nicotine
- hydrochlorothiazide (or any combination with hydrochlorothiazide)
- anticholinergics (substances generally used to treat movement disorders or intestinal cramps)
- anticonvulsants (substances used to prevent and relieve seizures)
- barbiturates (substances generally used to induce sleep)
- dopaminergic agonists (substances such as L-dopa, bromocriptine)
- neuroleptics (substances used in the treatment of mental disorders)
- oral anticoagulants

If you go into hospital, let your doctor know that you are taking Memantine ratiopharm.

Memantine ratiopharm with food and drink

You should inform your doctor if you have recently changed or intend to change your diet substantially (e.g. from normal diet to strict vegetarian diet) or if you are suffering from states of renal tubular acidosis (RTA, an excess of acid-forming substances in the blood due to renal dysfunction (poor kidney function)) or severe infections of the urinary tract (structure that carries urine), as your doctor may need to adjust the dose of your medicine.

Pregnancy and breast-feeding

If you are pregnant or breast-feeding, think you may be pregnant or are planning to have a baby, ask your doctor or pharmacist for advice before taking this medicine.

The use of memantine in pregnant women is not recommended.

Women taking Memantine ratiopharm should not breast-feed.

Driving and using machines

Your doctor will tell you whether your illness allows you to drive and to use machines safely. Also, Memantine ratiopharm may change your reactivity, making driving or operating machinery inappropriate.

Memantine ratiopharm contains lactose and soya lecithin

This medicine contains lactose. If you have been told by your doctor that you have an intolerance to some sugars, contact your doctor before taking this medicinal product.

This medicine contains soya lecithin. If you are allergic to peanut or soya, do not take this medicinal product.

3. How to take Memantine ratiopharm

Always take this medicine exactly as your doctor has told you. Check with your doctor or pharmacist if you are not sure.

Dosage

The recommended dose of Memantine ratiopharm for adults and older patients is 20 mg once a day.

In order to reduce the risk of side effects this dose is achieved gradually by the following daily treatment scheme. For up-titration other tablet strengths are available.

At the beginning of treatment you will start by using 5 mg once a day. This dose will be increased weekly by 5 mg until the recommended (maintenance) dose is reached. The recommended maintenance dose is 20 mg once a day, which is reached at the beginning of the 4th week.

The tablet can be divided into equal doses.

Dosage in patients with impaired kidney function

If you have impaired kidney function, your doctor will decide upon a dose that suits your condition. In this case, monitoring of your kidney function should be performed by your doctor at specified intervals.

Administration

Memantine ratiopharm should be administered orally once a day. To benefit from your medicine you should take it regularly every day at the same time of the day.

The tablets should be swallowed with some water. The tablets can be taken with or without food.

Duration of treatment

Continue to take Memantine ratiopharm as long as it is of benefit to you. Your doctor should assess your treatment on a regular basis.

If you take more Memantine ratiopharm than you should

- In general, taking too much Memantine ratiopharm should not result in any harm to you. You may experience increased symptoms as described in section 4. "Possible side effects".
- If you take a large overdose of Memantine ratiopharm, contact your doctor or get medical advice, as you may need medical attention.

If you forget to take Memantine ratiopharm

- If you find you have forgotten to take your dose of Memantine ratiopharm, wait and take your next dose at the usual time.
- Do not take a double dose to make up for a forgotten dose.

If you have any further questions on the use of this medicine, ask your doctor or pharmacist.

4. Possible side effects

Like all medicines, this medicine can cause side effects, although not everybody gets them.

In general, the observed side effects are mild to moderate.

Common (affects 1 to 10 users in 100):

- Headache, sleepiness, constipation, elevated liver function tests, dizziness, balance disorders, shortness of breath, high blood pressure and drug hypersensitivity

Uncommon (affects 1 to 10 users in 1,000):

- Tiredness, fungal infections, confusion, hallucinations, vomiting, abnormal gait, heart failure and venous blood clotting (thrombosis/thromboembolism)

Very Rare (affects less than 1 user in 10,000):

- Seizures

Not known (frequency cannot be estimated from the available data):

- Inflammation of the pancreas, inflammation of the liver (hepatitis) and psychotic reactions

Alzheimer's disease has been associated with depression, suicidal ideation and suicide. These events have been reported in patients treated with memantine.

Reporting of side effects

If you get any side effects, talk to your doctor or pharmacist. This includes any possible side effects not listed in this leaflet. You can also report side effects directly via [the national reporting system listed in Appendix V](#). By reporting side effects you can help provide more information on the safety of this medicine.

5. How to store Memantine ratiopharm

Keep this medicine out of the sight and reach of children.

Do not use this medicine after the expiry date which is stated on the carton and the blister pack after EXP. The expiry date refers to the last day of that month.

Blister packs

Do not store above 25°C.

HDPE bottles

This medicinal product does not require any special storage conditions.

Shelf life after first opening of the container: 6 months

Do not throw away any medicines via wastewater or household waste. Ask your pharmacist how to throw away medicines you no longer use. These measures will help protect the environment.

6. Contents of the pack and other information

What Memantine ratiopharm contains

- The active substance is memantine hydrochloride.
Each film-coated tablet contains 20 mg memantine hydrochloride equivalent to 16.62 mg memantine.
- The other ingredients are:
Tablet core
Cellulose microcrystalline (E 460), starch pregelatinised (E 1404), lactose anhydrous, colloidal anhydrous silica (E 551), magnesium stearate (E 470b).
Coating
Polysorbate 80 (E 433), polyvinyl alcohol (E 1203), titanium dioxide (E 171), talc (E 553b), soya lecithin (E 322), xanthan gum (E 415).

What Memantine ratiopharm looks like and contents of the pack

White to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with "20" on the other side.

Memantine ratiopharm is available in packs of 10, 14, 21, 28, 30, 42, 56, 98 and 100 film-coated tablets.

Not all pack sizes may be marketed.

Marketing Authorisation Holder

ratiopharm GmbH
Graf-Arco-Straße 3
89079 Ulm
Germany

Manufacturer

Merckle GmbH
Ludwig-Merckle-Straße 3
89143 Blaubeuren
Germany

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For any information about this medicine, please contact the local representative of the Marketing Authorisation Holder:

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This leaflet was last revised in

Detailed information on this medicine is available on the European Medicines Agency web site:
<http://www.ema.europa.eu>.

Package leaflet: Information for the patient

Memantine ratiopharm 5 mg film-coated tablets
Memantine ratiopharm 10 mg film-coated tablets
Memantine ratiopharm 15 mg film-coated tablets
Memantine ratiopharm 20 mg film-coated tablets
memantine hydrochloride

Read all of this leaflet carefully before you start taking this medicine because it contains important information for you.

- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor or pharmacist.
- This medicine has been prescribed for you only. Do not pass it on to others. It may harm them, even if their signs of illness are the same as yours.
- If you get any side effects, talk to your doctor or pharmacist. This includes any possible side effects not listed in this leaflet. See section 4.

What is in this leaflet

1. What Memantine ratiopharm is and what it is used for
2. What you need to know before you take Memantine ratiopharm
3. How to take Memantine ratiopharm
4. Possible side effects
5. How to store Memantine ratiopharm
6. Contents of the pack and other information

1. What Memantine ratiopharm is and what it is used for

How does Memantine ratiopharm work

Memantine ratiopharm contains the active substance memantine hydrochloride. It belongs to a group of medicines known as anti-dementia medicines.

Memory loss in Alzheimer's disease is due to a disturbance of message signals in the brain. The brain contains so-called N-methyl-D-aspartate (NMDA)-receptors that are involved in transmitting nerve signals important in learning and memory. Memantine ratiopharm belongs to a group of medicines called NMDA-receptor antagonists. Memantine ratiopharm acts on these NMDA-receptors improving the transmission of nerve signals and the memory.

What is Memantine ratiopharm used for

Memantine ratiopharm is used for the treatment of patients with moderate to severe Alzheimer's disease.

2. What you need to know before you take Memantine ratiopharm

Do not take Memantine ratiopharm:

- if you are allergic to memantine hydrochloride, peanut or soya or any of the other ingredients of this medicine (listed in section 6).

Warnings and precautions

Talk to your doctor or pharmacist before taking Memantine ratiopharm:

- if you have a history of epileptic seizures.
- if you have recently experienced a myocardial infarction (heart attack), or if you are suffering from congestive heart failure or from an uncontrolled hypertension (high blood pressure).

In these situations the treatment should be carefully supervised, and the clinical benefit of Memantine ratiopharm reassessed by your doctor on a regular basis.

If you suffer from renal impairment (kidney problems), your doctor should closely monitor your kidney function and if necessary adapt the memantine doses accordingly.

The use of medicinal products called

- amantadine (for the treatment of Parkinson's disease),
- ketamine (a substance generally used as an anaesthetic),
- dextromethorphan (generally used to treat cough) and
- other NMDA-antagonists

at the same time should be avoided.

Children and adolescents

Memantine ratiopharm is not recommended for children and adolescents under the age of 18 years.

Other medicines and Memantine ratiopharm

Tell your doctor or pharmacist if you are taking/using, have recently taken/used or might take/use any other medicines.

In particular, Memantine ratiopharm may change the effects of the following medicines and their dose may need to be adjusted by your doctor:

- amantadine, ketamine, dextromethorphan
- dantrolene, baclofen
- cimetidine, ranitidine, procainamide, quinidine, quinine, nicotine
- hydrochlorothiazide (or any combination with hydrochlorothiazide)
- anticholinergics (substances generally used to treat movement disorders or intestinal cramps)
- anticonvulsants (substances used to prevent and relieve seizures)
- barbiturates (substances generally used to induce sleep)
- dopaminergic agonists (substances such as L-dopa, bromocriptine)
- neuroleptics (substances used in the treatment of mental disorders)
- oral anticoagulants

If you go into hospital, let your doctor know that you are taking Memantine ratiopharm.

Memantine ratiopharm with food and drink

You should inform your doctor if you have recently changed or intend to change your diet substantially (e.g. from normal diet to strict vegetarian diet) or if you are suffering from states of renal tubular acidosis (RTA, an excess of acid-forming substances in the blood due to renal dysfunction (poor kidney function)) or severe infections of the urinary tract (structure that carries urine), as your doctor may need to adjust the dose of your medicine.

Pregnancy and breast-feeding

If you are pregnant or breast-feeding, think you may be pregnant or are planning to have a baby, ask your doctor or pharmacist for advice before taking this medicine.

The use of memantine in pregnant women is not recommended.

Women taking Memantine ratiopharm should not breast-feed.

Driving and using machines

Your doctor will tell you whether your illness allows you to drive and to use machines safely. Also, Memantine ratiopharm may change your reactivity, making driving or operating machinery inappropriate.

Memantine ratiopharm contains lactose and soya lecithin

This medicine contains lactose. If you have been told by your doctor that you have an intolerance to some sugars, contact your doctor before taking this medicinal product.

This medicine contains soya lecithin. If you are allergic to peanut or soya, do not take this medicinal product.

3. How to take Memantine ratiopharm

The Memantine ratiopharm treatment initiation pack is only to be used for the beginning of the treatment with Memantine ratiopharm.

Always take this medicine exactly as your doctor has told you. Check with your doctor or pharmacist if you are not sure.

Dosage

The recommended treatment dose of 20 mg per day is achieved by a gradual increase of the Memantine ratiopharm dose during the first 3 weeks of treatment. Take one tablet once a day.

Week 1 (day 1-7):

Take one 5 mg tablet once a day (white to off-white, capsule shaped, biconvex, plain on one side and debossed with “5” on the other side) for 7 days.

Week 2 (day 8-14):

Take one 10 mg tablet once a day (white to off-white, capsule shaped, biconvex, with a break score on one side and debossed with “10” on the other side) for 7 days.

Week 3 (day 15-21):

Take one 15 mg tablet once a day (white to off-white, capsule shaped, biconvex, plain on one side and debossed with “15” on the other side) for 7 days.

Week 4 (day 22-28):

Take one 20 mg tablet once day (white to off-white, capsule shaped, biconvex, with a break score on one side and debossed with “20” on the other side) for 7 days.

week 1	5 mg tablet
week 2	10 mg tablet
week 3	15 mg tablet
week 4 and beyond	20 mg tablets once a day

Maintenance dose

The recommended daily dose is 20 mg once a day. For continuation of the treatment please consult your doctor.

Dosage in patients with impaired kidney function

If you have impaired kidney function, your doctor will decide upon a dose that suits your condition. In this case, monitoring of your kidney function should be performed by your doctor at specified intervals.

Administration

Memantine ratiopharm should be administered orally once a day. To benefit from your medicine you should take it regularly every day at the same time of the day.

The tablets should be swallowed with some water. The tablets can be taken with or without food.

Duration of treatment

Continue to take Memantine ratiopharm as long as it is of benefit to you. Your doctor should assess your treatment on a regular basis.

If you take more Memantine ratiopharm than you should

- In general, taking too much Memantine ratiopharm should not result in any harm to you. You may experience increased symptoms as described in section 4. “Possible side effects”.
- If you take a large overdose of Memantine ratiopharm, contact your doctor or get medical advice, as you may need medical attention.

If you forget to take Memantine ratiopharm

- If you find you have forgotten to take your dose of Memantine ratiopharm, wait and take your next dose at the usual time.
- Do not take a double dose to make up for a forgotten dose.

If you have any further questions on the use of this medicine, ask your doctor or pharmacist.

4. Possible side effects

Like all medicines, this medicine can cause side effects, although not everybody gets them.

In general, the observed side effects are mild to moderate.

Common (affects 1 to 10 users in 100):

- Headache, sleepiness, constipation, elevated liver function tests, dizziness, balance disorders, shortness of breath, high blood pressure and drug hypersensitivity

Uncommon (affects 1 to 10 users in 1,000):

- Tiredness, fungal infections, confusion, hallucinations, vomiting, abnormal gait, heart failure and venous blood clotting (thrombosis/thromboembolism)

Very Rare (affects less than 1 user in 10,000):

- Seizures

Not known (frequency cannot be estimated from the available data):

- Inflammation of the pancreas, inflammation of the liver (hepatitis) and psychotic reactions

Alzheimer’s disease has been associated with depression, suicidal ideation and suicide. These events have been reported in patients treated with memantine.

Reporting of side effects

If you get any side effects, talk to your doctor or pharmacist. This includes any possible side effects not listed in this leaflet. You can also report side effects directly via [the national reporting system listed in Appendix V](#). By reporting side effects you can help provide more information on the safety of this medicine.

5. How to store Memantine ratiopharm

Keep this medicine out of the sight and reach of children.

Do not use this medicine after the expiry date which is stated on the carton and the blister pack after EXP. The expiry date refers to the last day of that month.

Do not store above 25°C.

Do not throw away any medicines via wastewater or household waste. Ask your pharmacist how to throw away medicines you no longer use. These measures will help protect the environment.

6. Contents of the pack and other information

What Memantine ratiopharm contains

- The active substance is memantine hydrochloride.
Each film-coated tablet contains 5 mg memantine hydrochloride equivalent to 4.15 mg memantine.
Each film-coated tablet contains 10 mg memantine hydrochloride equivalent to 8.31 mg memantine.
Each film-coated tablet contains 15 mg memantine hydrochloride equivalent to 12.46 mg memantine.
Each film-coated tablet contains 20 mg memantine hydrochloride equivalent to 16.62 mg memantine.
- The other ingredients are:
Tablet core
Cellulose microcrystalline (E 460), starch pregelatinised (E 1404), lactose anhydrous, colloidal anhydrous silica (E 551), magnesium stearate (E 470b).
Coating
Polysorbate 80 (E 433), polyvinyl alcohol (E 1203), titanium dioxide (E 171), talc (E 553b), soya lecithin (E 322), xanthan gum (E 415).

What Memantine ratiopharm looks like and contents of the pack

The 5 mg film-coated tablets are white to off-white, capsule shaped, biconvex tablets plain on one side and debossed with “5” on the other side.

The 10 mg film-coated tablets are white to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with “10” on the other side.

The 15 mg film-coated tablets are white to off-white, capsule shaped, biconvex tablets plain on one side and debossed with “15” on the other side.

The 20 mg film-coated tablets are white to off-white, capsule shaped, biconvex tablets with a break score on one side and debossed with “20” on the other side.

Memantine ratiopharm is available in packs with 28 (7 +7 +7 + 7) film-coated tablets.

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